C015/015 Incoming

#4055

OK

EarthFax

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May 17, 2012

Steve Christensen
Permit Supervisor
Utah Division of Oil, Gas and Mining
Coal Program
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5901

Subject: Emery Mine Permit
Groundwater Monitoring Plan Revision
NOV 10088 Abatement
Clean Copies

Dear Steve:

At the request of Consolidation Coal Company, I am pleased to submit six hard copies and two CDs with electronic versions of documents addressing the above matter. This submittal also includes executed C1 and C2 forms. It is our understanding that this submittal will abate Notice of Violation 10088.

If you have any questions concerning this submittal, please contact John Gefferth at 618-625-6850. Thank you for your assistance.

Sincerely,

Richard B. White, P.E.
President
EarthFax Engineering, Inc.

Enclosure

Cc: John Gefferth

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DIV. OF OIL, GAS & MINING

File in:
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Date Folder 051712 C/0150015
Incoming

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: Consolidation Coal Company
Mine: Emery Mine **Permit Number:** 015/015
Title: Groundwater Monitor revision
Description, Include reason for application and timing required to implement:
Revision to Groundwater monitoring plan NOV 10088 abatement Clean copies additional info 5/12

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ Disturbed Area: _____ ☐ increase ☐ decrease.
☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes ☒ No 6. Does the application require or include public notice publication?
☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☒ Yes ☐ No 9. Is the application submitted as a result of a Violation? NOV # 10088
☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes ☒ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
☐ Yes ☒ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
☒ Yes ☐ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
☐ Yes ☒ No 19. Does the application require or include certified designs, maps or calculation?
☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
☐ Yes ☒ No 21. Have reclamation costs for bonding been provided?
☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

MARK T. STANLEY
Print Name

Sign Name, Position, Date
GENERAL MANAGER - ENVIRONMENTAL Permitting

Subscribed and sworn to before me this 14th day of May, 2012

Janice L. Davis
Notary Public

My commission Expires: October 19, 2013
Attest: State of Pennsylvania } ss:
County of Washington

NOTARIAL SEAL
JANICE L DAVIS
Notary Public
CECIL TWP., WASHINGTON COUNTY
My Commission Expires Oct 19, 2013

For Office Use Only:	Assigned Tracking Number:	Received by Oil, Gas & Mining
		RECEIVED MAY 17 2012 DIV. OF OIL, GAS & MINING

Form DOGM- C1 (Revised March 12, 2002)

APPLICATION FOR COAL PERMIT PROCESSING
Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: Consolidation Coal Company
Mine: Emery Mine **Permit Number:** 015/015
Title: Revision to groundwater monitoring plan, NOV 10088 abatement, Clean copies additional info, 5/12

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

Add	Replace	Remove	DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☐	☒	☐	Chapter VI, page VI-viii
☐	☒	☐	Chapter VI, page VI-27
☐	☒	☐	Chapter VI, page VI-28
☐	☒	☐	Chapter VI, page VI-39
☐	☒	☐	Chapter VI, page 41
☐	☒	☐	Chapter VI, Table VI-17
☒	☐	☐	Chapter VI, Appendix VI-17
☒	☐	☐	Chapter VI, Appendix VI-18
☐	☐	☐	Chapter VI, Plate VI-4, Groundwater Monitoring Well & Surface Water Monitoring Site Location Map
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Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.	Received by Oil, Gas & Mining
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Form DOGM - C2 (Revised March 12, 2002)

LIST OF APPENDICES

2. Ephemeral streamflow typically carries a high sediment load. This sediment will fill remaining cracks. As the cracks heal, the potential for interception of streamflow is minimized.
3. The depressions created by subsidence are sufficiently broad that changes in slope are not typically of an ample magnitude to cause ponding in anything other than local areas.

Potential Hydrocarbon Contamination. Diesel fuel, oils, greases, and other hydrocarbon products are stored and used at the site for a variety of purposes. Diesel and oil stored in above-ground tanks at the mine surface facilities may spill onto the ground during filling of the storage tank, leakage of the storage tank, or filling of the vehicle tank. Similarly, greases and other oils may be spilled during use in surface and underground operations.

The probable future extent of the contamination caused by diesel and oil spillage is expected to be small for three reasons. First, because the tanks are located above ground, leakage from the tanks can be readily detected and repaired. Second, spillage during filling of the storage or vehicle tanks is minimized to avoid loss of an economically valuable product. Finally, the mine has a Spill Prevention Control and Countermeasure Plan that provides inspection, training, and operation measures to minimize the extent of contamination resulting from the use of hydrocarbons at the site.

Motor oil was introduced into some of the monitoring wells several years ago for reasons that are not clear. An investigation of this issue, conducted in January 2012, concluded that this oil is not causing substantial contamination of the monitored aquifers (see Appendix VI-18).

Coal Spillage During Hauling. Coal is hauled over County roads from the mine to State Highway 10 and future destinations. Past experience has indicated that no substantial quantities of coal have been spilled during transport. If coal is spilled, it may wash into local streams during a runoff event prior to cleanup. Possible impacts to the surface water include increases in total suspended solids and turbidity from the fine coal particulates. The probability of a spill occurring in an area sufficiently close to a stream channel to introduce coal to the stream bed is extremely small.

Areal Extent of Probable Hydrologic Consequences. The above discussion indicates that the probable hydrologic consequences of mining at the Emery Mine will be limited in areal extent as follows:

- Contamination from acid- and toxic-forming materials – Very limited areal extent of impact, if any.
- Increased sediment yield from disturbed areas – No impacts downstream from disturbed areas.
- Impacts to groundwater availability – Drawdown of the groundwater potentiometric surface due to mine dewatering may extend northward to an area south of the Emery Town wells, westward to the Joe's Valley-Paradise Fault Zone, eastward to the area of Muddy Creek, and southward to an area north of Ivie Creek.
- Impacts to surface water availability – Increased flow in Quitchupah Creek and immediate downstream portions of Ivie Creek.
- Increased total dissolved solids concentrations in surface and groundwater – Slight increase in TDS concentrations in Quitchupah Creek and immediate downstream portions of Ivie Creek. Temporary increase in TDS concentrations in the upper Ferron Sandstone adjacent to the mine.
- Flooding and streamflow alteration – Very limited areal extent of impact, if any.
- Potential hydrocarbon contamination – Very limited areal extent of impact, if any.
- Coal spillage during hauling – Very limited areal extent of impact, if any.

Surface Water Protection. To protect the hydrologic balance, coal mining and reclamation operations will be conducted to handle earth materials and runoff in a manner that minimizes acidic or toxic drainage, prevents, to the extent possible, additional contributions of suspended solids to streamflow outside the permit area, and otherwise prevents water pollution. Additionally, Consol will maintain adequate runoff- and sediment-control facilities to protect local surface waters.

VI.3.1.2 Water Monitoring

Groundwater Monitoring. Groundwater monitoring is conducted in the permit and adjacent areas according to the water monitoring plans presented in Table VI-17. The locations of the monitoring points are presented on Plate VI-4. The monitoring plans were developed based on information presented in the PHC determination, the baseline hydrologic data, the 2011 re-evaluation presented in Appendix VI-17, and the geology chapter of this document.

The monitoring programs provide data that are reviewed and compared to the baseline data. Any significant changes are evaluated to determine their impact on the hydrologic balance. Results of these evaluations are submitted periodically to the Division.

Sampling for the Emery Mine area is accomplished in accordance with the schedule outlined in Table VI-17. Monitoring at locations that are inaccessible during winter months are sampled three times per year. All other sites are monitored quarterly. Groundwater monitoring data are submitted to the Division by the end of the quarter following sampling. Monitoring data are submitted in an annual summary by March 31 of the subsequent year.

Groundwater monitoring will continue through the mining and post-mining periods until bond release. The monitoring requirements, including the analytical parameters and the sampling frequency may be modified in the future in consultation with the Division if the data demonstrate that such a modification is justified.

Equipment, structures and other devices used in conjunction with monitoring the quality and quantity of groundwater in the permit and adjacent areas have been installed, maintained, and operated in accordance with accepted procedures. Where feasible, this equipment will be removed or properly abandoned by Consol when no longer needed.

Surface Water Monitoring. Surface water monitoring is conducted in the permit and adjacent areas based upon the monitoring plans contained in Table VI-17. Surface water monitoring locations are identified on Plate VI-4. The parameters monitored meet the requirements of R614-301-731.222.1, 40 CFR 122 and 123, R614-301-751, and the applicable UPDES permits.

Surface water monitoring data are submitted to the Division by the end of the quarter following sampling. Monitoring data are submitted in an annual summary by March 31 of the subsequent year. UPDES reporting requirements will be met for the UPDES discharge sites at the mine.

Surface water monitoring will continue through the mining and post-mining periods until bond release. The monitoring requirements (except those required by UPDES) may be modified in the future in consultation with the Division if the data demonstrate that such a modification is justified.

channeled to sedimentation ponds. All surface drainage from the areas above the sites is diverted around the disposal areas using diversion ditches. No permanent impoundments will exist on the completed refuse piles.

VI.4.6.3 Impounding Structures

There are no impounding structures within the permit area that are constructed of coal mine waste or are used to impound coal mine waste.

VI.4.6.4 Return of Coal Processing Waste to Underground Workings

Coal processing waste is not returned to abandoned underground workings at this mine.

VI.4.7 Disposal of Noncoal Mine Waste

Disposal of noncoal mine waste is discussed in Chapter II.

VI.4.8 Casing and Sealing of Wells

Each monitoring well or other borehole associated with the Emery Mine has been cased, sealed, or otherwise managed, as approved by the Division, to prevent acid or other toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance, and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit and adjacent area. The drill logs and completion diagrams for the water wells are contained in Appendix VI-2.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division (see Section VI.6.5).

VI.5 PERFORMANCE STANDARDS

All mining and reclamation operations will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and support approved post-mining land uses.

VI.5.1 Water Quality Standards and Effluent Limitations

Discharges of water from disturbed areas will be in compliance with all Utah and Federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434.

VI.5.2 Sediment Control Measures

All sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs presented in Sections VI.3.2, VI.4.2, and VI.6.

VI.5.2.1 Siltation Structures and Diversions

Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs presented in Sections VI.3.2, VI.4.2, and VI.6.3.

VI.6.2.1 Restoring the Natural Drainage Patterns

All natural drainage patterns will be restored during reclamation.

VI.6.2.2 Reshaping Cut and Fill Slopes

All cut and fill slopes will be reshaped to be compatible with the post-mining land use and to complement the drainage pattern of the surrounding terrain.

VI.6.3 Siltation Structures

VI.6.3.1 Maintenance of Siltation Structures

All siltation structures will be maintained until removed in accordance with the approved reclamation plan.

VI.6.3.2 Removal of Siltation Structures

When a siltation structure is removed, the land on which the siltation structure was located will be regraded and revegetated in accordance with the reclamation plan presented in Chapter III.

VI.6.4 Structure Removal

A timetable for the removal of each structure is presented in Section III.A.2 of this MRP.

VI.6.5 Permanent Casing and Sealing of Wells

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well, each monitoring well or borehole associated with the Emery Mine will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division and in accordance with the most current regulations concerning well abandonment as promulgated by the Utah Division of Water Rights. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

TABLE VI-17

Emery Mine Hydrologic Monitoring Program

Parameter	Surface Water Monitoring Stations	Sampled Wells	Other Wells	Springs/Seeps	UPDES Outfalls
Monitoring Site Names	SWMS-1A, SWMS-2, SWMS-3, SWMS-4, SWMS-5, SWMS-8, SWMS-9, SWMS-10	Emery Town[a], Kemmerer, RDA-2, RDA-4, RDA-6, SM1-3, T1, USGS4-1	H-U, MUDDY #1, R-1, R-2B, R-2M	SP-10, SP-11, SP-13, SP-14, SP-15	001, 002, 003, 004, 005, 006, 007, 009
Monitoring Frequency	Quarterly	Quarterly, except RDA wells (annual)	Quarterly	Quarterly flows. Samples in 2nd and 3rd quarters	Per permit
Field Measurements					
Flow	X			X	X
Water Level		X	X		
pH (field)	X	X		X	X
Sp. Cond. (field)	X	X		X	
Water Temp. (field)	X	X		X	
Laboratory Measurements					
Total Settleable Solids	X				
Total Suspended Solids	X				X
Total Dissolved Solids	X	X		X	X
Total Hardness (as $CaCO_3$)	X	X		X	
Oil and Grease	X				X
Acidity (as $CaCO_3$)	X				
Carbonate	X	X		X	
Bicarbonate	X	X		X	
Alkalinity (as $CaCO_3$)					
Calcium, Total	X				
Calcium, Dissolved	X	X		X	
Chloride	X	X		X	
Iron, Total	X				X
Iron, Dissolved		X		X	
Magnesium, Total	X				
Magnesium, Dissolved		X		X	
Manganese, Total	X				
Manganese, Dissolved		X		X	
Potassium, Total	X				
Potassium, Dissolved		X		X	
Sodium, Total	X				
Sodium, Dissolved		X		X	
Sulfate		X		X	

[a] Due to physical limitations in the Emery town wells (see text), water-quality samples will be collected from Well #1 and water-level data will be collected from Well #2. Consol will evaluate data collected from the Emery town wells, using hydrographs and other appropriate means, and submit a report of findings to DOGM with the annual report.

APPENDIX VI-17

Evaluation/Revision of
Groundwater Monitoring Plan (08/2011)

Inserted 03/2012

August 22, 2011

EarthFax

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Mr. John Gefferth
Director, Coal Permitting
Consolidation Coal Company
P.O. Box 566
Sesser, IL 62884-0566

Subject: Recommended revisions to the Emery Mine Groundwater monitoring plan

Dear John:

Pursuant to your request, I have reviewed the data collected from the Emery Mine groundwater monitoring network to determine if changes to the monitoring plan are appropriate. The results of my review are summarized in the following documents attached to this letter:

- Table 1 – presents a summary of the trends observed at each monitoring well, the condition of each well (as appropriate), and recommendations regarding whether each well should be retained or eliminated from the monitoring network.
- Attachment A – presents graphs showing water levels in the existing monitoring wells, grouped by the zones that they monitor.
- Attachment B – presents graphs comparing water levels in wells completed in Quaternary Alluvium with the Palmer Hydrologic Drought Index (used as a general indication of climatic trends during the period of data collection).

Of the 46 wells that are currently part of the Emery Mine groundwater monitoring network, I have recommended that 15 be retained for future monitoring and 31 be eliminated from the plan. By zone of completion, I recommend that wells be retained as follows:

- Quaternary Alluvium – 4 wells
- Bluegate Shale – 3 wells
- Upper Ferron Sandstone – 4 wells
- Middle Ferron Sandstone – 1 wells
- Lower Ferron Sandstone – 2 wells
- Wells completed in multiple zones – 1 well (Emery Town well)

I have appreciated the opportunity to provide this review. Please contact me if you have any questions.

Sincerely,

Richard B. White, P.E.
President
EarthFax Engineering, Inc.

Attachments

TABLE 1

Recommended Revisions to the
Emery Mine Groundwater Monitoring Plan

Well	Data Summary	Proposed Plan	
		Retain	Eliminate
RDA 1	These wells are located in a relatively small area south of Quitchupah Creek overlying a section of the mine that has not been active for over 30 years. Water levels are relatively stable, but correlate generally with climatic trends (as evidenced by comparison with the Palmer Hydrologic Drought Index). Water quality data exhibit wide variation over relatively short distances. Well RDA 6 may be influenced by the nearby mine-water discharge pond. Given their close proximity to each other, it is not necessary to collect data from all of these wells.		X
RDA 2		X	
RDA 3			X
RDA 4		X	
RDA 5			X
RDA 6		X	
SM1-1	Water level data collected from these two wells correlate generally with climatic trends. Salinity levels are higher at SM1-1 than SM1-2. SM1-1 is located in an area that receives significant irrigation return flow and is, therefore, difficult to access. SM1-2 has been buried in a road and is no longer accessible.		X
SM1-2			X
SM1-3	Water levels in these wells show no substantial climatic trends, but fluctuate seasonally due to nearby irrigation. SM1-3 is in an area of recent mining. SM1-4 is located in an area where mining has not been active for over 40 years.	X	
SM1-4			X
AA	Water levels have been relatively stable since the mid 1980s. No water quality data. Area has been mined out for approximately 30 years.		X
H	Water levels were initially stable for 27 years, but have been erratic since 2007. The cause of the water-level fluctuations is unknown. However, oil was recently discovered in this well, probably due to communication with one of the deeper "H" wells. No water quality data.		X
I	Water levels have been relatively stable for several years. Oil has existed in this well for several years, rendering it unfit for data collection. No water quality data.		X
R2	A very gradual decline in water levels has occurred during the past 20 years. One data point (Sep 2008) is an obvious outlier. This well is located near a mine dewatering pump and Pond 06. Should be retained to monitor potential impacts from these operations. No water quality data.	X	
T1	Water levels have been relatively stable for the 30-year period of record. Occasional water quality data exist. Located near the center of the mine area. Should be retained as an indicator of potential impacts in the general area.	X	
T2	Water levels have been relatively stable for the 30-year period of record. No water quality data. Essentially duplicates well T1 and is, therefore, not needed.		X

Well	Data Summary	Proposed Plan	
		Retain	Eliminate
USGS 3-1	Water levels have been relatively stable except for data collected in 2007 and 2008. Some water level data are reported as being deeper than the completed well, indicating reporting errors. Adjacent to other wells with more reliable data.		X
USGS 4-1	Adjacent to well USGS 3-1, but with more reliable data. Water levels declined in 2006, then rebounded. Mostly dry, but in an area of recent mining. Water quality data have been collected here.	X	
Bryant	Relatively stable water levels since an initial decline in the mid 1980s. Consol provided a pump and ancillary facilities to the well owner several years ago. However, this pump is no longer functioning and the owner has not required that it be repaired. This makes data collection difficult.		X
AA	Water levels have been relatively stable since the early 1980s. No water quality data. Area has been mined out for approximately 30 years.		X
H	Water levels have been relatively stable for the period of record. No water quality data. Located between the mine and the town of Emery. Should be retained as an indicator of potential impacts in adjacent areas.	X	
I2	Water levels have fluctuated over a range of about 30 feet during the 25-year period of record, with no consistent trends. No water quality data. Therefore, well is of limited value.		X
Lewis	Relatively stable water levels since an initial decline in the mid 1980s. This well has been sealed and abandoned by its owner and is no longer accessible.		X
Muddy #1	Relatively stable water levels during the 30+-year period of record. No water quality data. Some future mining activity may occur in the general area.	X	
Muddy #2	With the exception of a few obvious outliers, water levels have fluctuated over a range of about 40 feet during the 25-year period of record, with no consistent trends. No water quality data. There appears to be an obstruction in the well. Therefore, the well is of limited value.		X
R2	This well is located adjacent to a mine dewatering pump and has shown substantial changes in water levels through time. Good long-term indication of potential groundwater impacts adjacent to the mine.	X	
T1	Except for a few data points that appear to be erroneous, water levels have shown a gradual decline for the 30-year period of record. Limited water quality data exist. Located near the center of the mine area. Should be retained as an indicator of potential impacts in the general area.	X	
T2	Except for a few data points that appear to be erroneous, water levels have been relatively stable for about 20 years. Limited water quality data exist. Data unnecessary due to the nearby location of T1.		X
TP	Except for a few data points that appear to be erroneous, water levels have been relatively stable for about 20 years. Limited water quality data exist. Data unnecessary due to the nearby location of T1.		X
USGS1-2	Good water level data prior to 2003. However, since that time, it appears that the well is obstructed, since the probe cannot consistently extend below a depth of 30 feet.		X

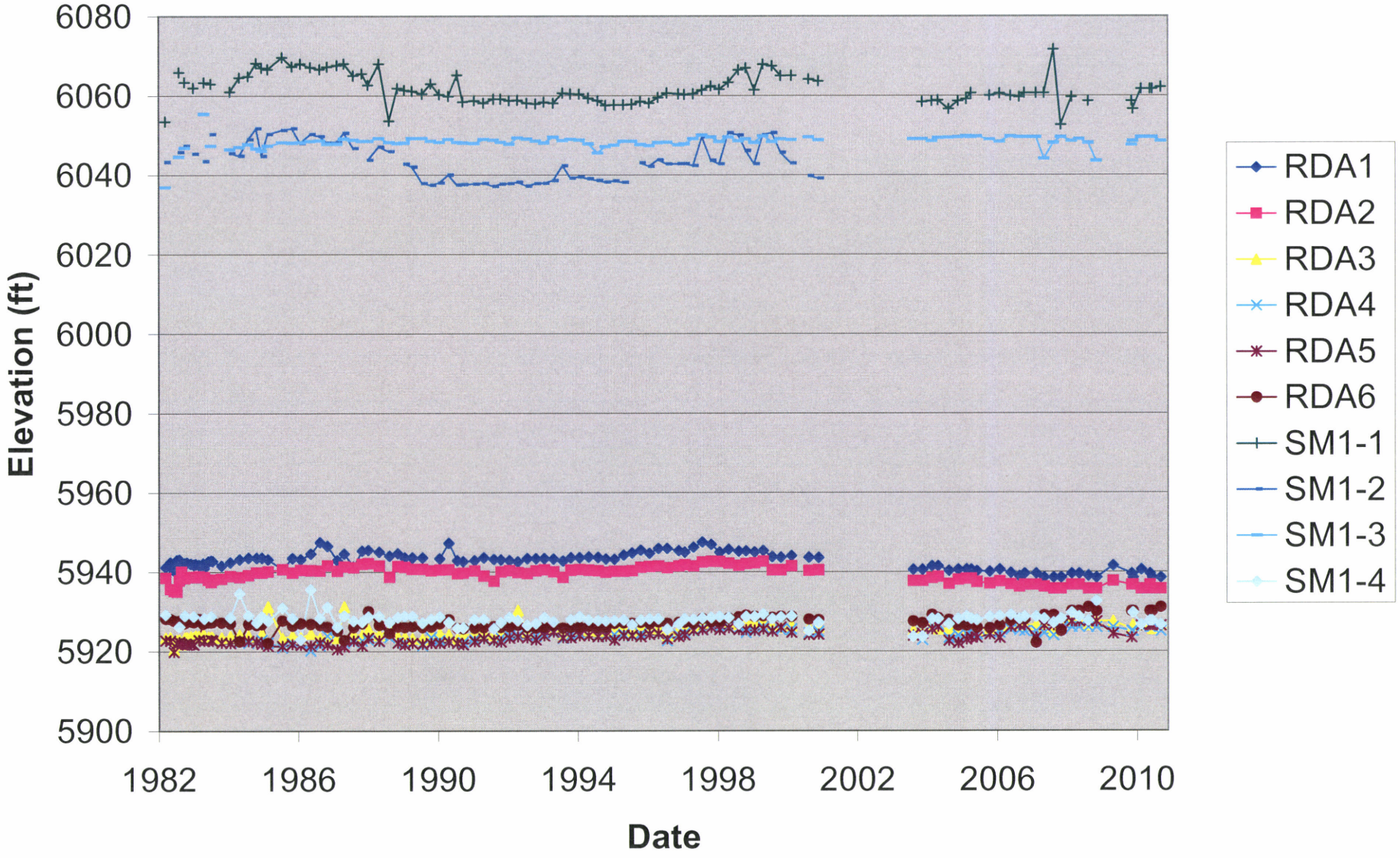
Well	Data Summary	Proposed Plan	
		Retain	Eliminate
AA	Water levels have been relatively stable since the early 1980s. No water quality data. Oil has existed in this well for several years, rendering it unfit for data collection.		X
H	Water levels have been relatively stable since the early 1990s. No water quality data. Oil has existed in this well for several years, rendering it unfit for data collection.		X
I	Data indicate that the water level dropped about 150 feet in mid 2005. However, oil has existed in this well for several years, rendering the data spurious and the well unfit for data collection. No water quality data.		X
R2	Water levels in this well dropped over 500 feet in the late 1980s and have since begun to recover. This well should be retained as an indicator of conditions in the aquifer immediately underlying the coal seam being mined.	X	
AA	Relatively stable water levels during the 30+-year period of record. No water quality data. No future mining activity planned in the area.		X
H	Water levels have been relatively stable since the early 1990s. No water quality data. Oil has existed in this well for several years, rendering it unfit for data collection.		X
I	With the exception of one data point that appears to be erroneous, water levels in this well have been relatively table during the 30-year period of record. No water quality data.		X
Kemmerer	Water levels have gradually declined in this well during the nearly 40-year period of record. Water quality data have been collected from this well. Retain as an indicator of potential groundwater impacts in adjacent areas.	X	
R1	Water levels have been relatively stable since declining in the early 1990s (Note: data from this artesian well have been incorrectly reported as a depth to water rather than a water pressure since 2001). Retain this well as an indicator of groundwater conditions upgradient from the mine.	X	
WW1	Water levels have been relatively stable during the entire period of record. Located in an area where no future mining activities are planned.		X
ZZ	Water levels have been relatively stable during the entire period of record. This well has been damaged, rendering it unfit for data collection.		X
Emery Town Wells	This monitoring location consists of two wells. Well #1 is completed in the lower Ferron Sandstone and has a functional pump. Water quality data are collected from this well. Well #2 is completed in the upper and middle Ferron Sandstone and can be accessed for the collection of water level data. Retain as an indicator of groundwater conditions in adjacent areas and as an indicator or potential impacts to public water supplies in the region.	X	

Well	Data Summary	Proposed Plan	
		Retain	Eliminate
EMRIA #1	Single well completed in both the upper and middle Ferron Sandstone. No water quality data. Relatively stable water levels during the entire 30-year period of record. Of limited value due to its completion in multiple zones.		X
EMRIA #2	Single well completed across all three zones of the Ferron Sandstone (upper, middle, and lower). Of limited value due to its completion in multiple zones.		X
EMRIA #3	Single well completed in the Bluegate Shale and the upper Ferron Sandstone. Of limited value due to its completion in multiple zones.		X
FC346WW	Single well completed in both the upper and middle Ferron Sandstone. No water quality data. Gradually declining water levels since the mid 1980s. Of limited value due to its completion in multiple zones.		X

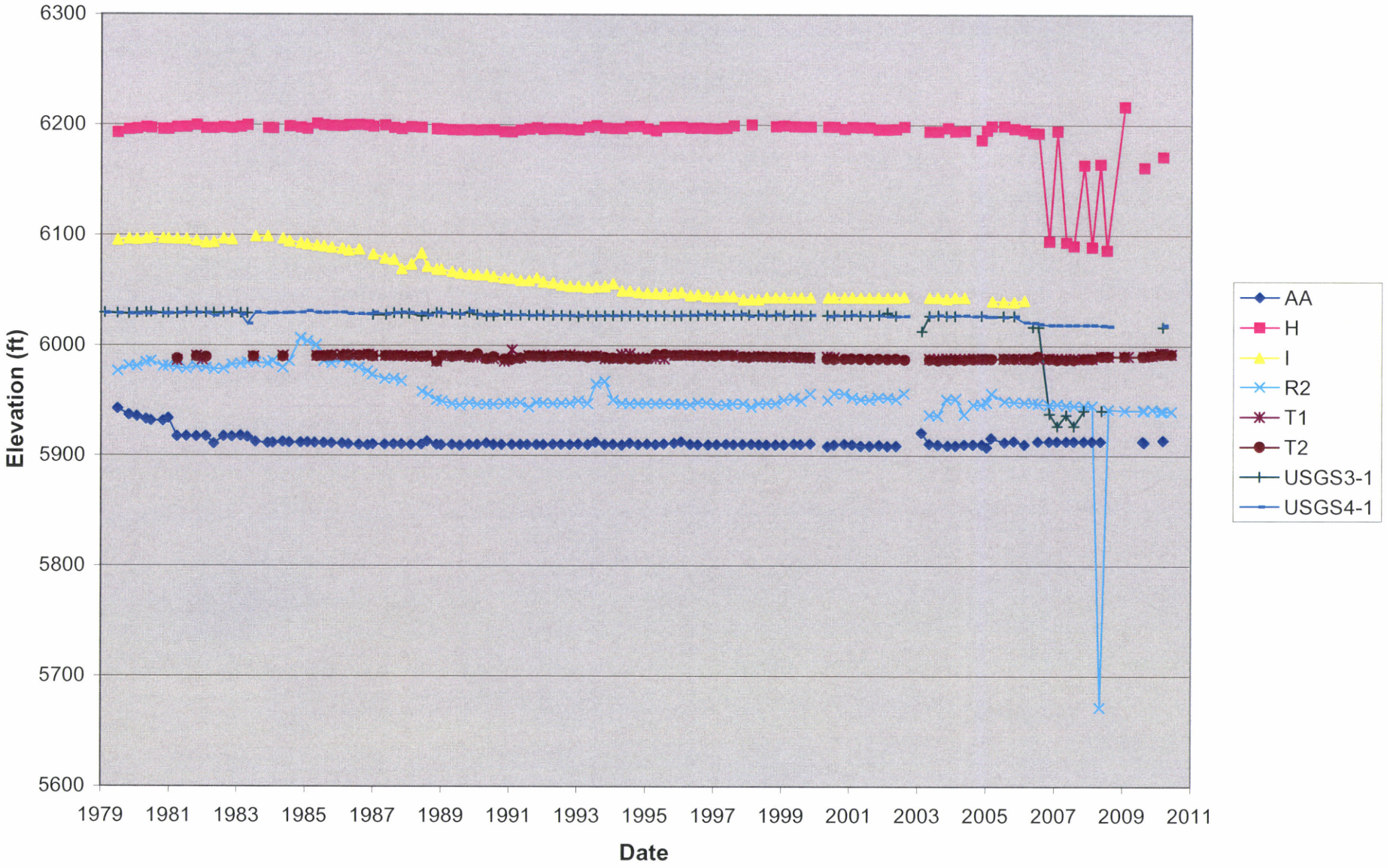
ATTACHMENT A

Hydrographs of Emery Mine Monitoring Wells

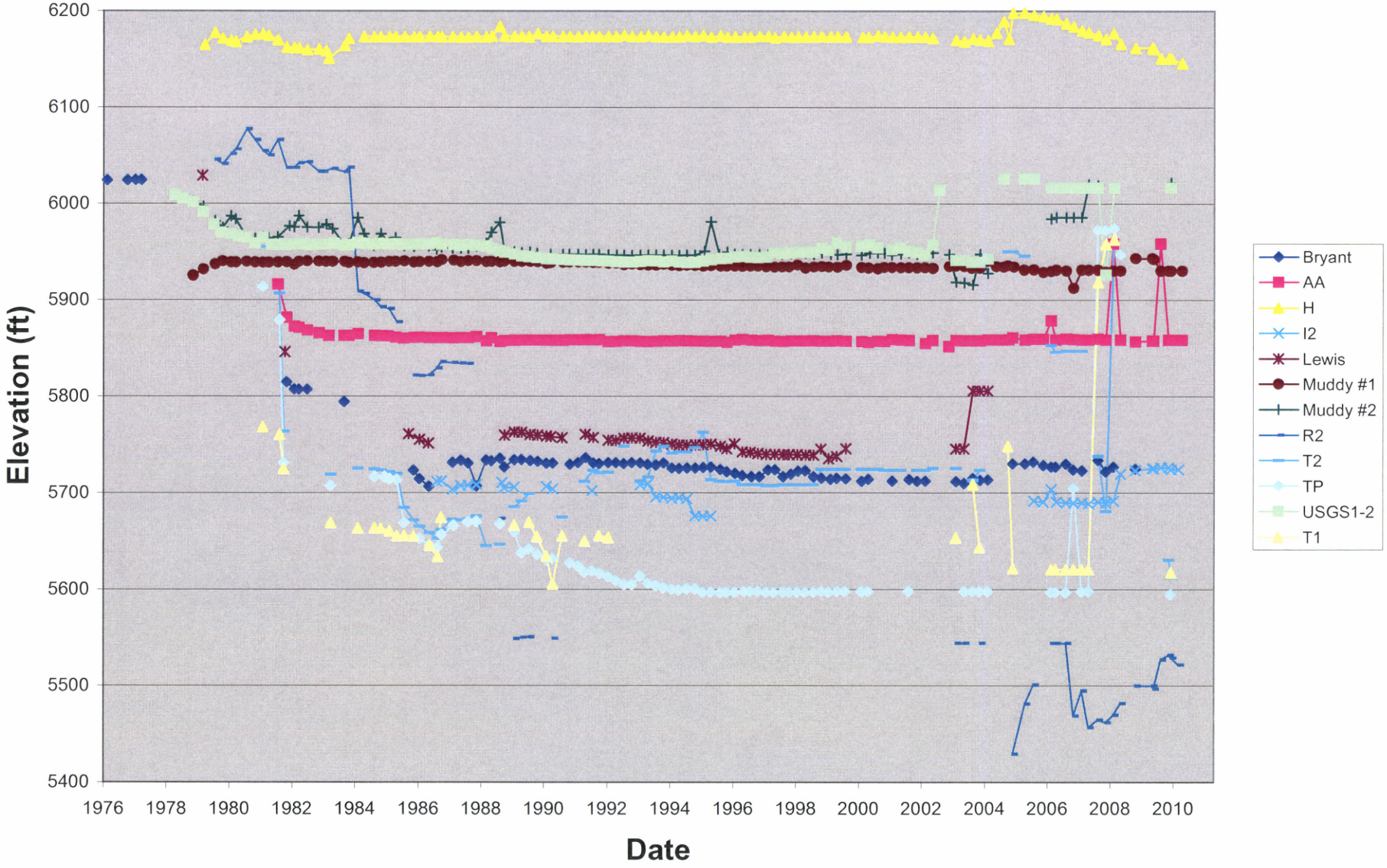
Qal Hydrographs



Kmb Hydrographs



Kmf(u) Hydrographs



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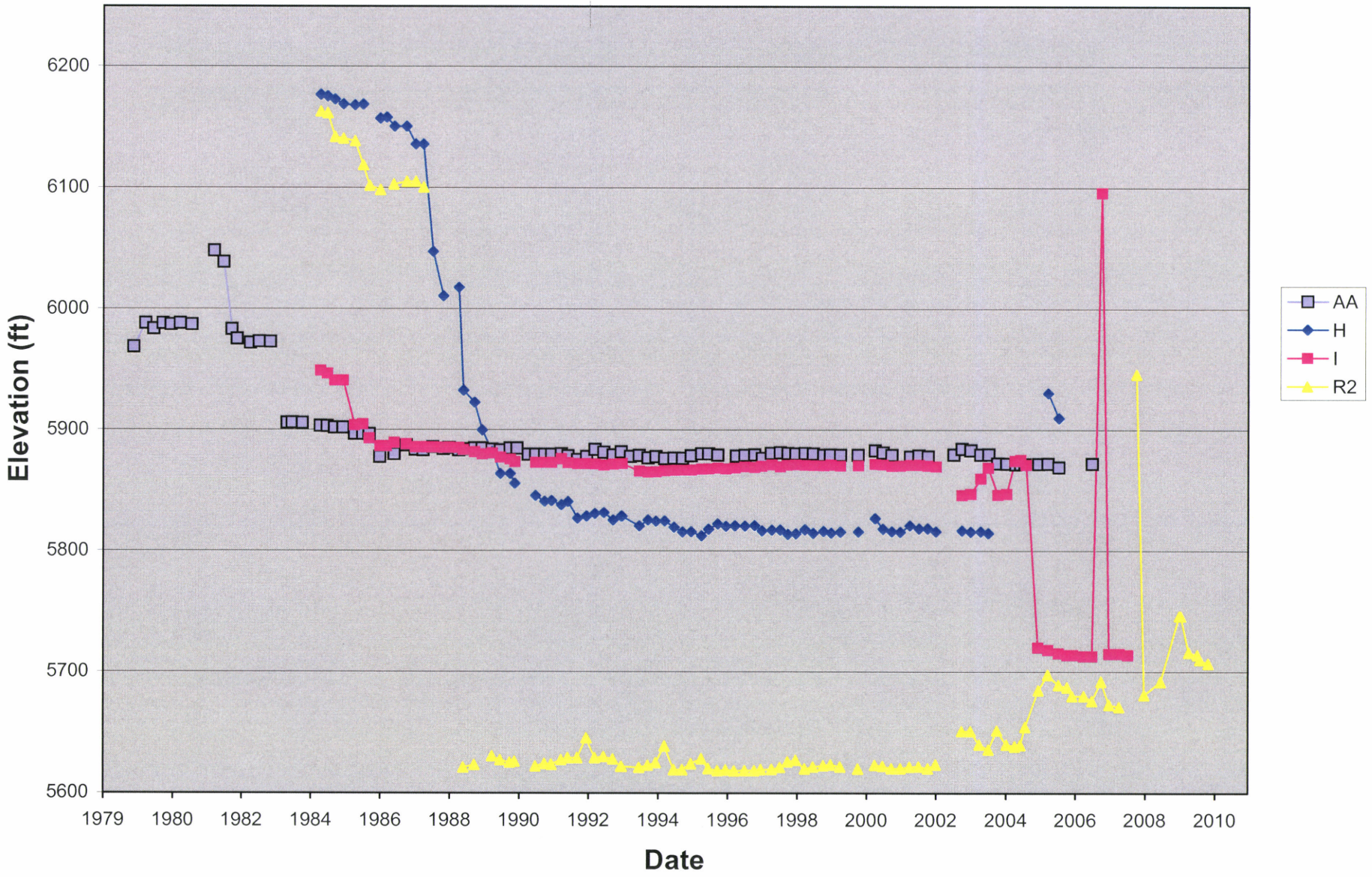
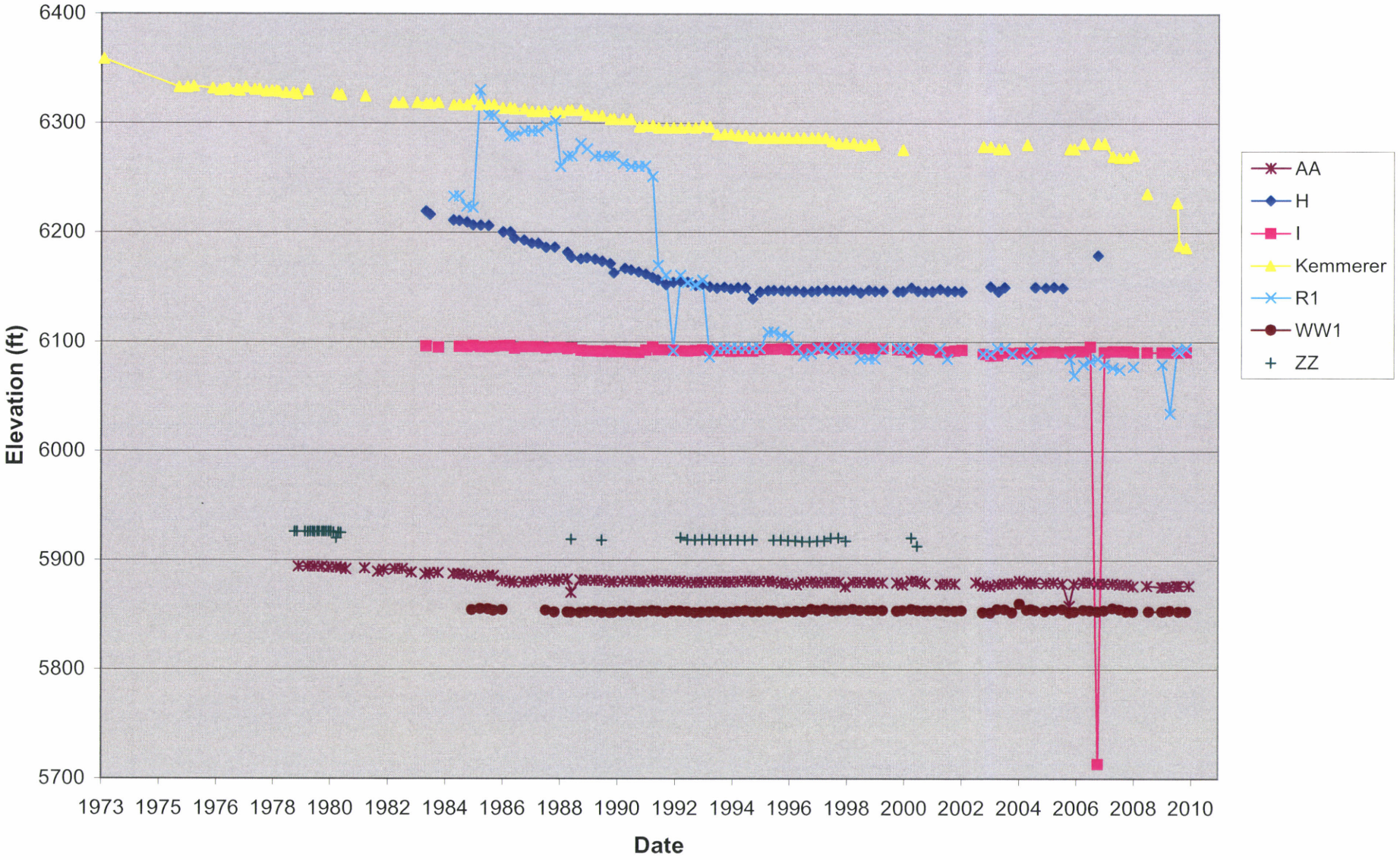


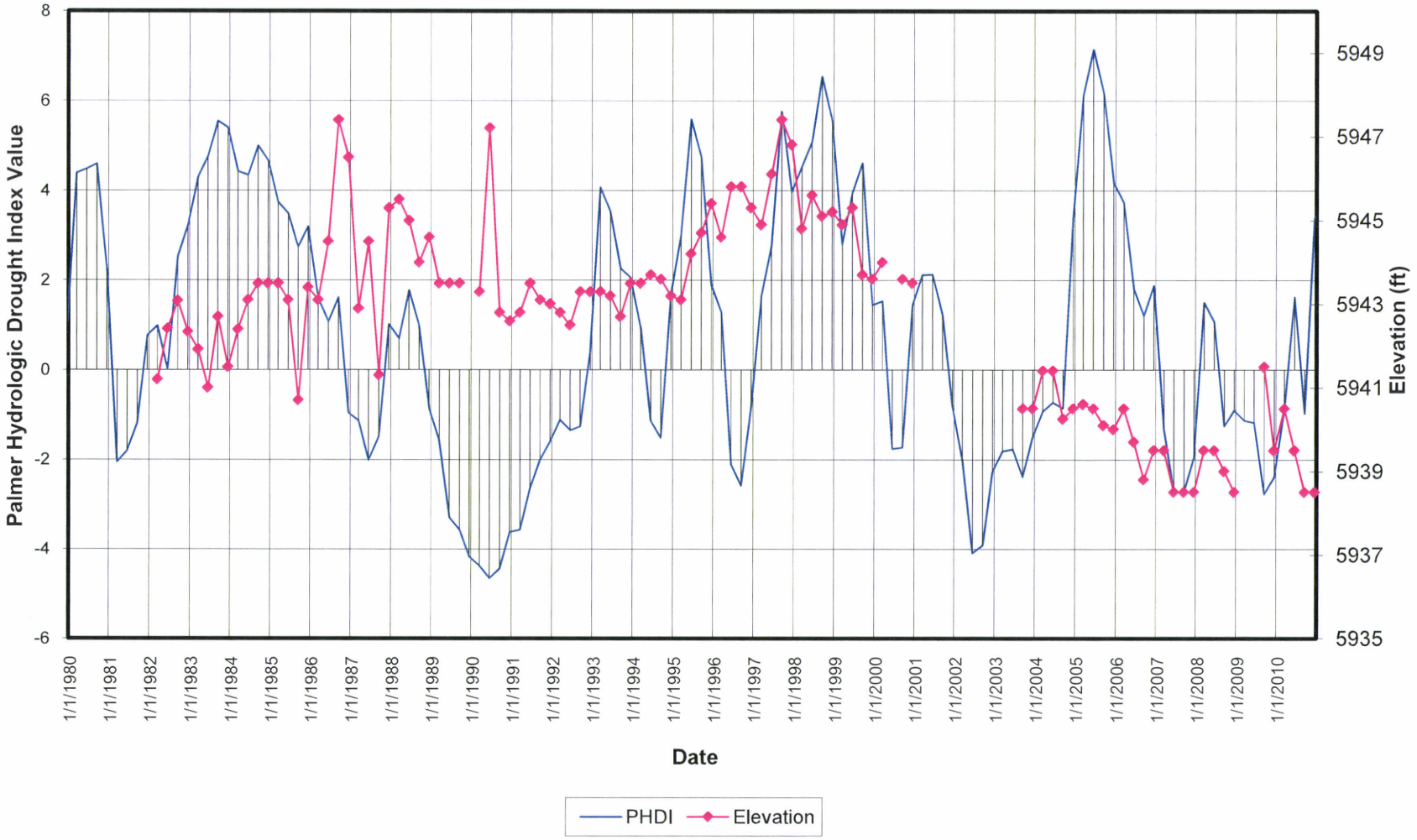
Kmf(I) Hydrographs



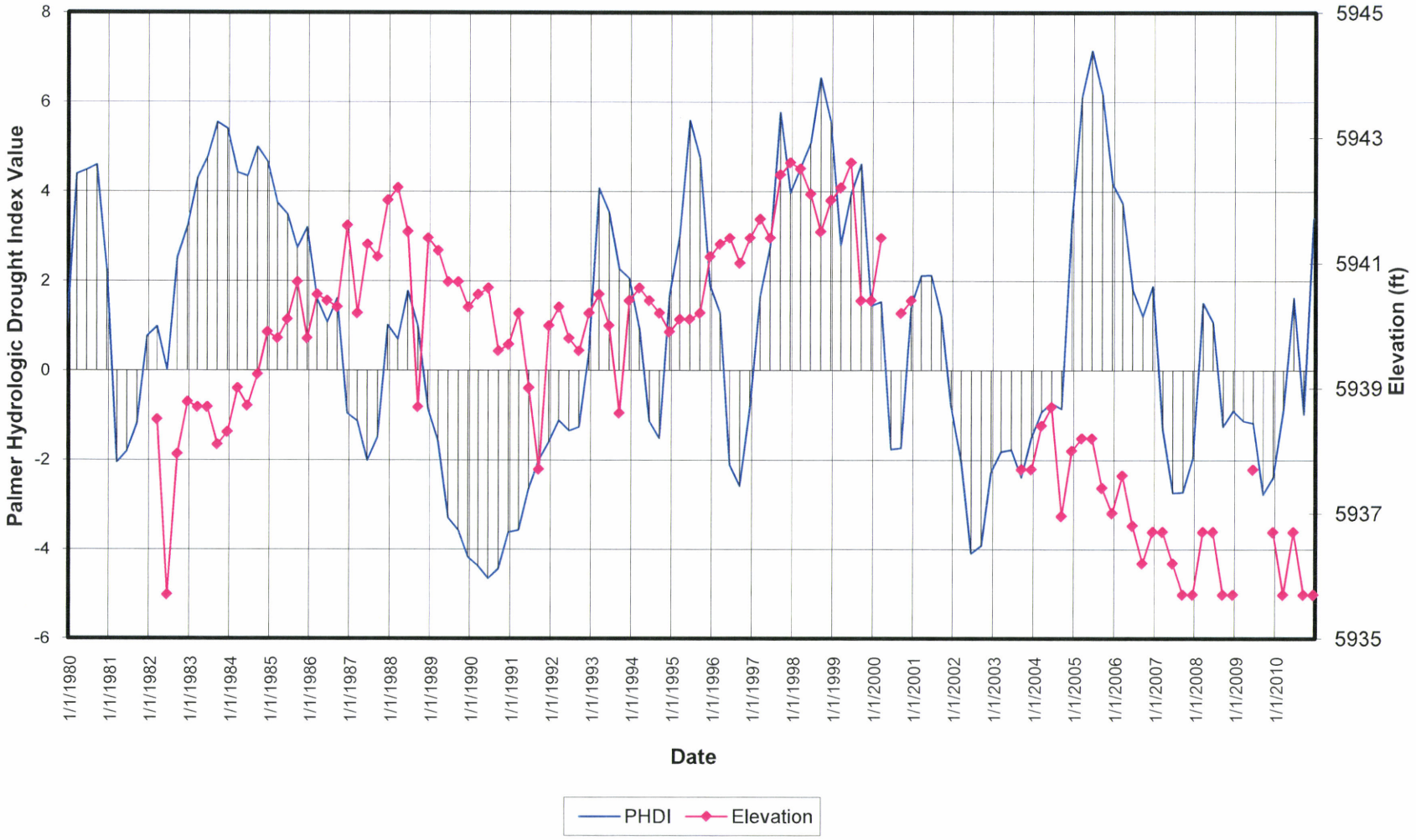
ATTACHMENT B

Comparison of Hydrographs in Wells
Monitoring Quaternary Alluvium with the
Palmer Hydrologic Drought Index

COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL RDA1



COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL RDA2



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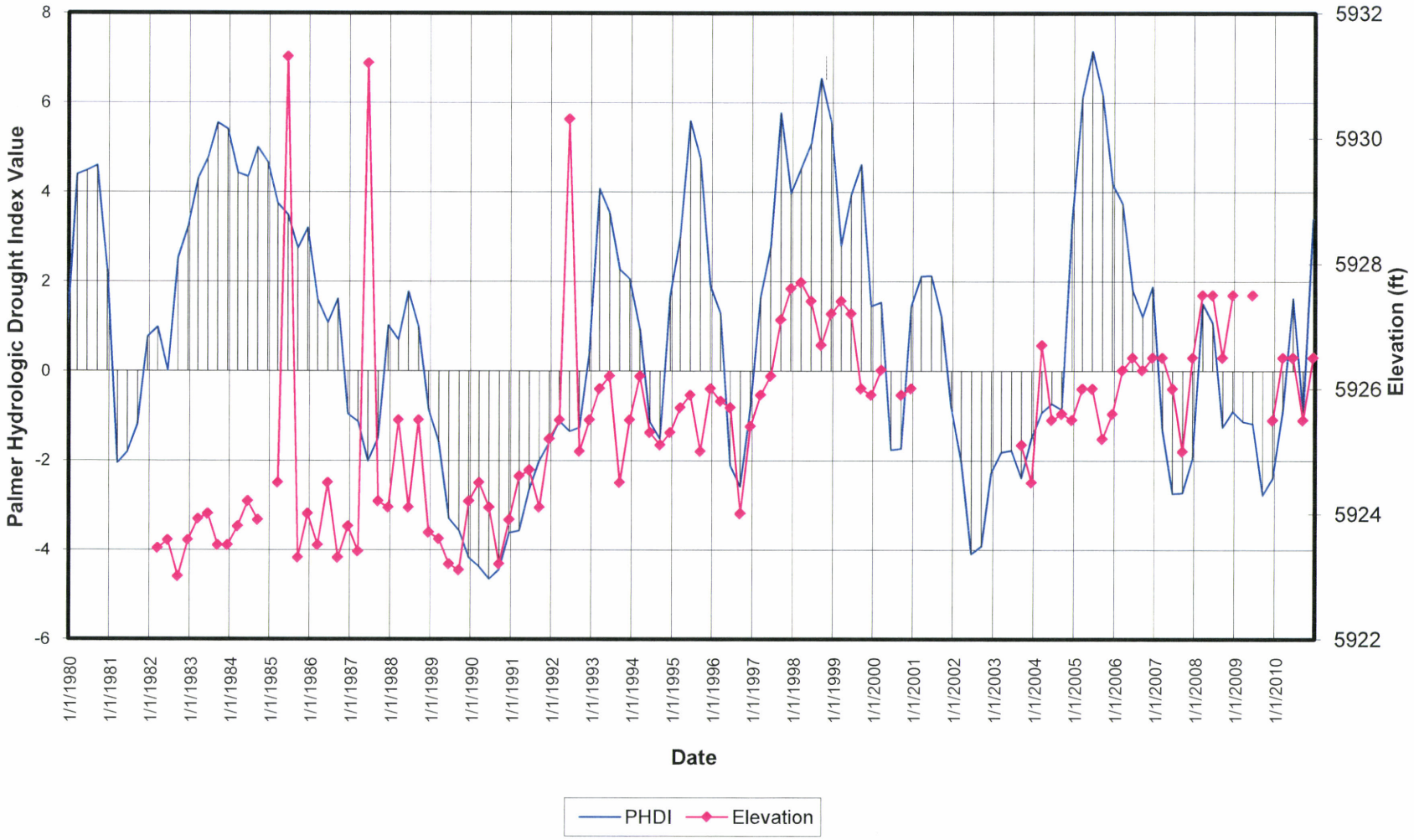
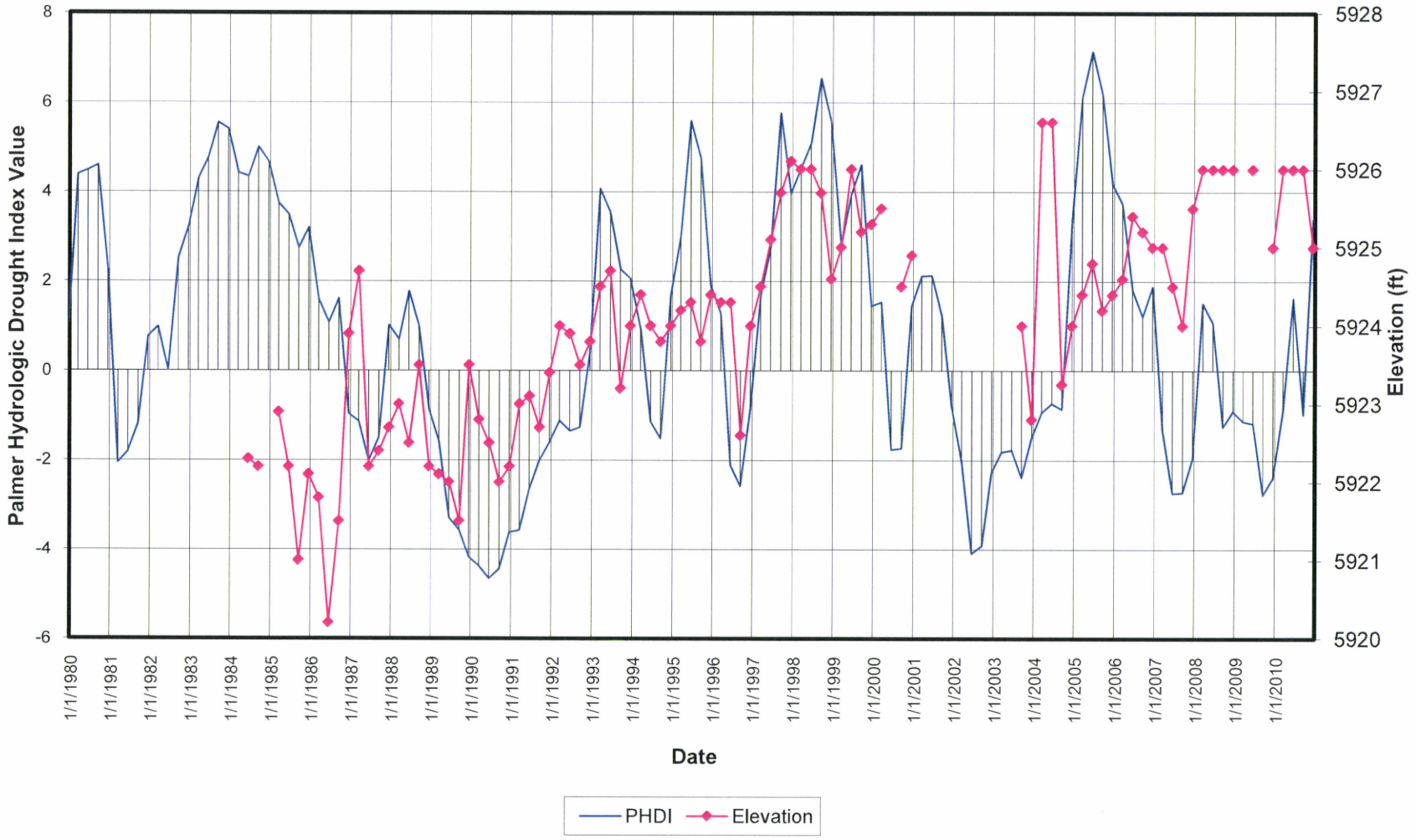
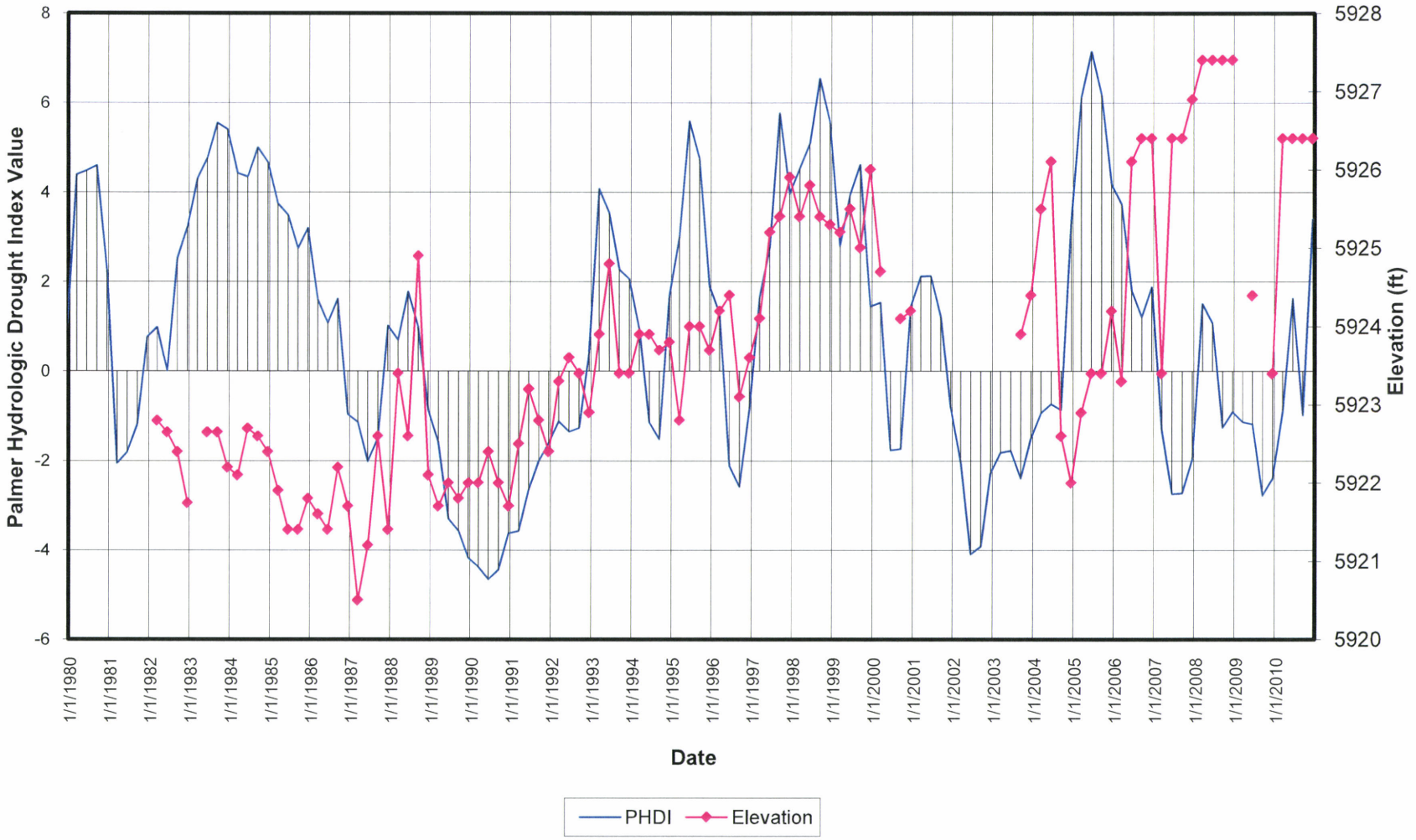


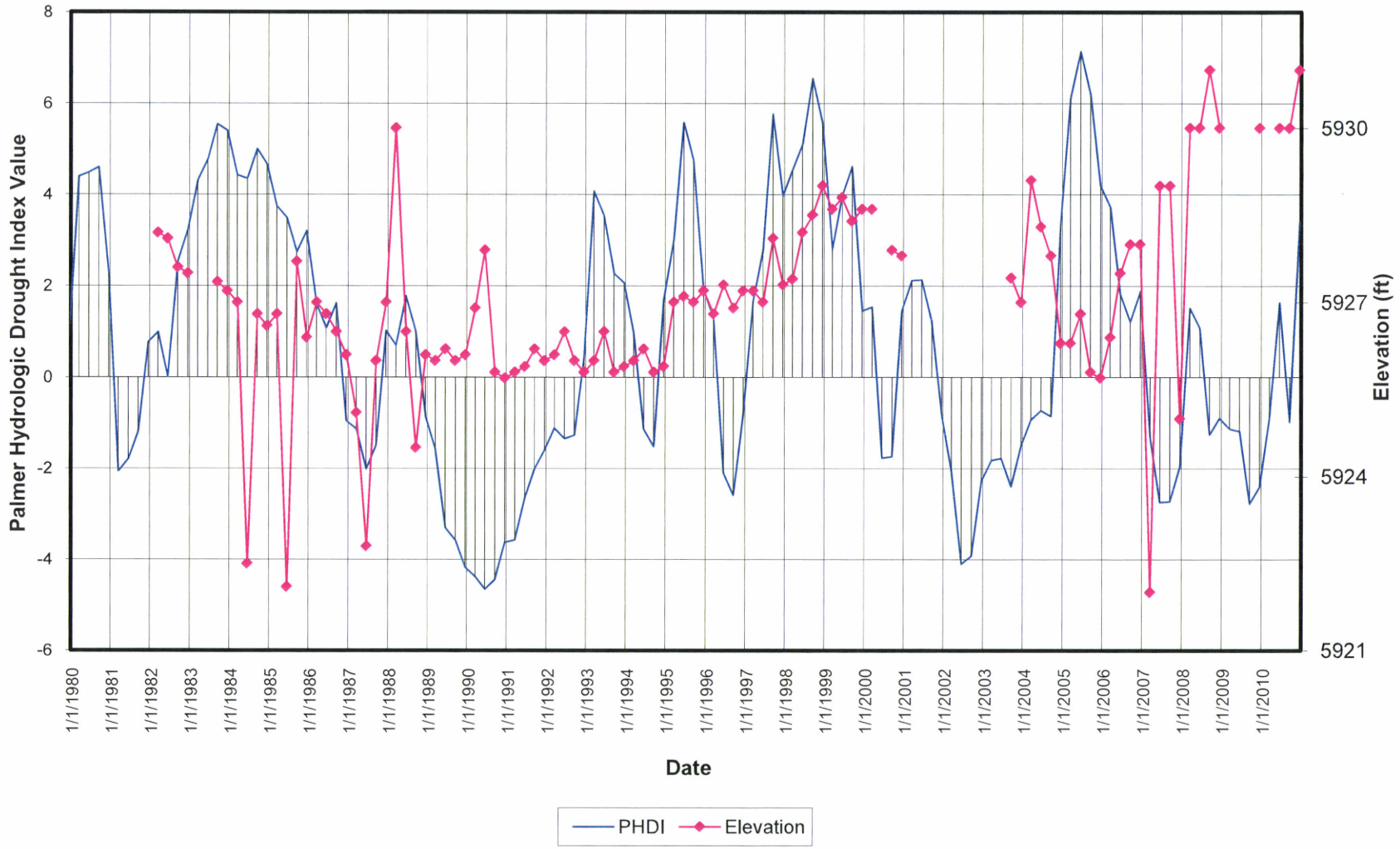
COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL RDA4



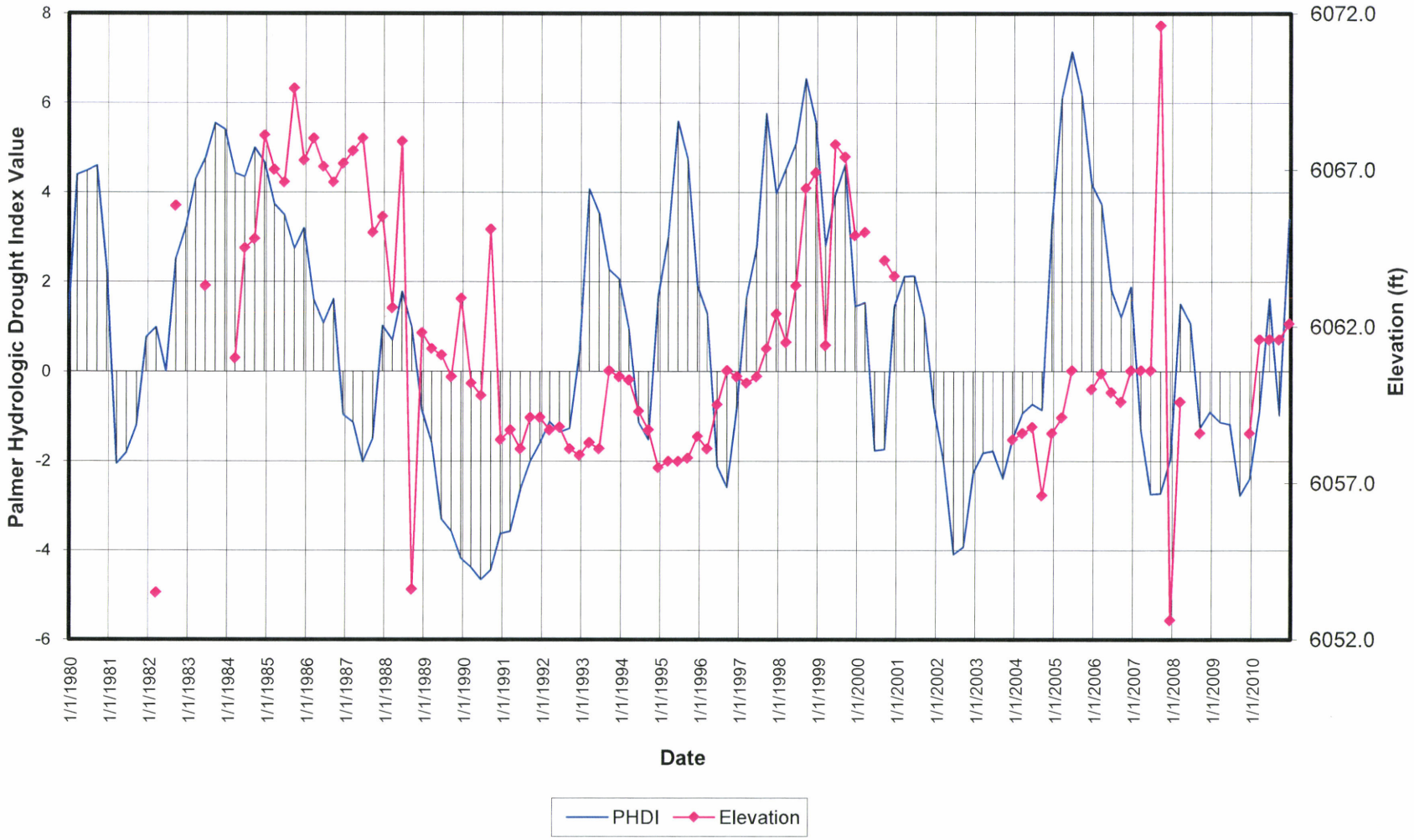
COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL RDA5



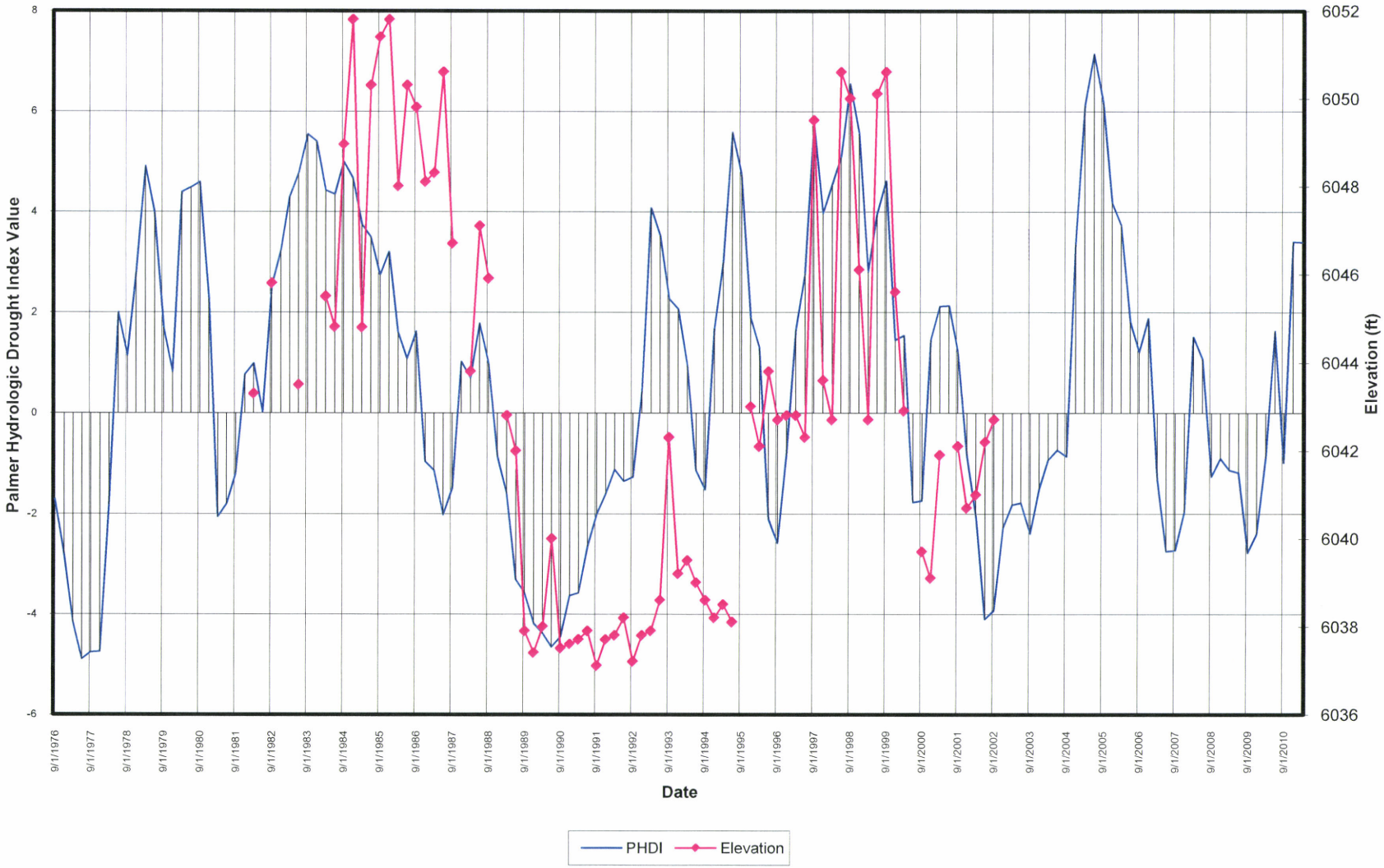
COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL RDA6



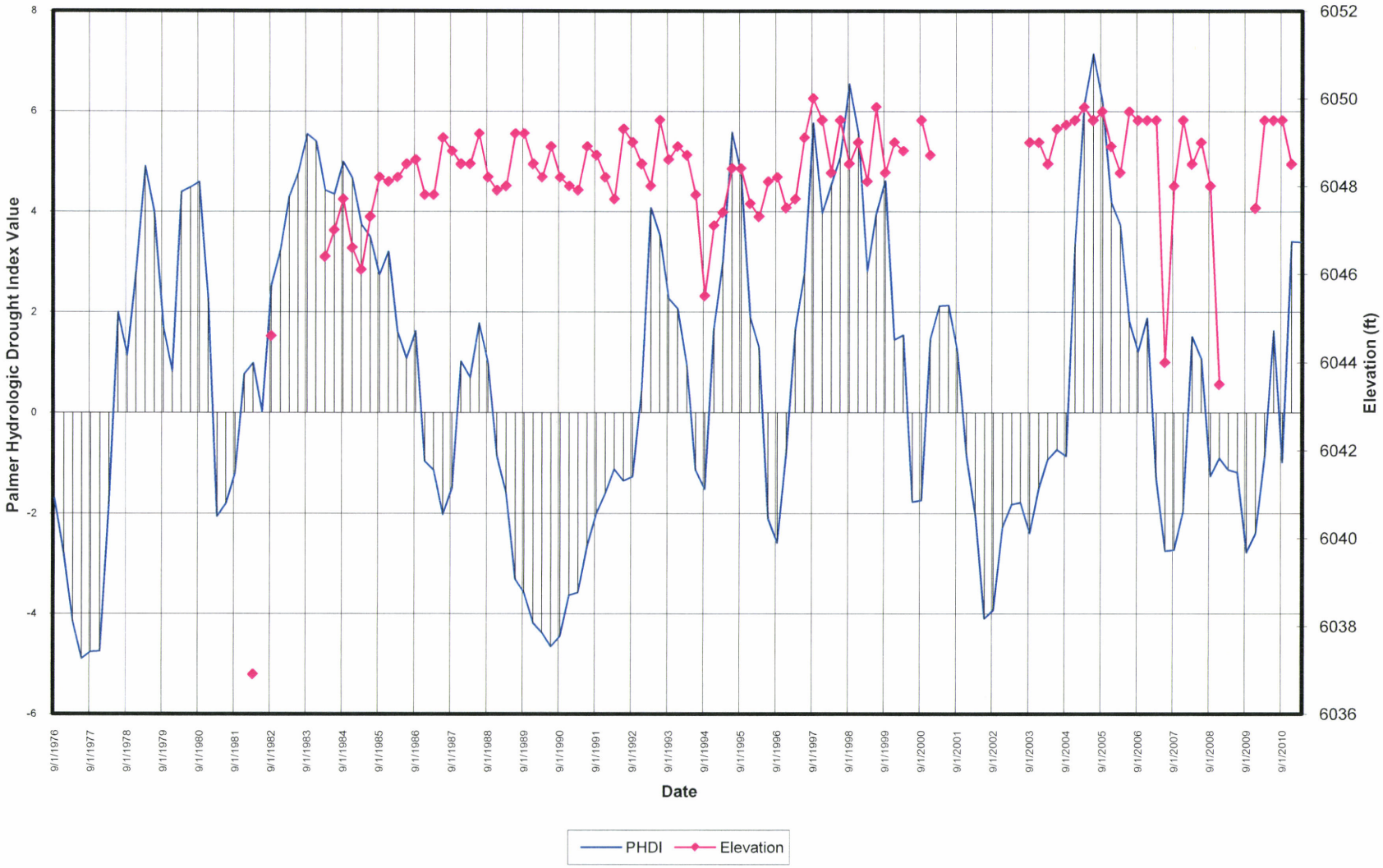
COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL SM1-1



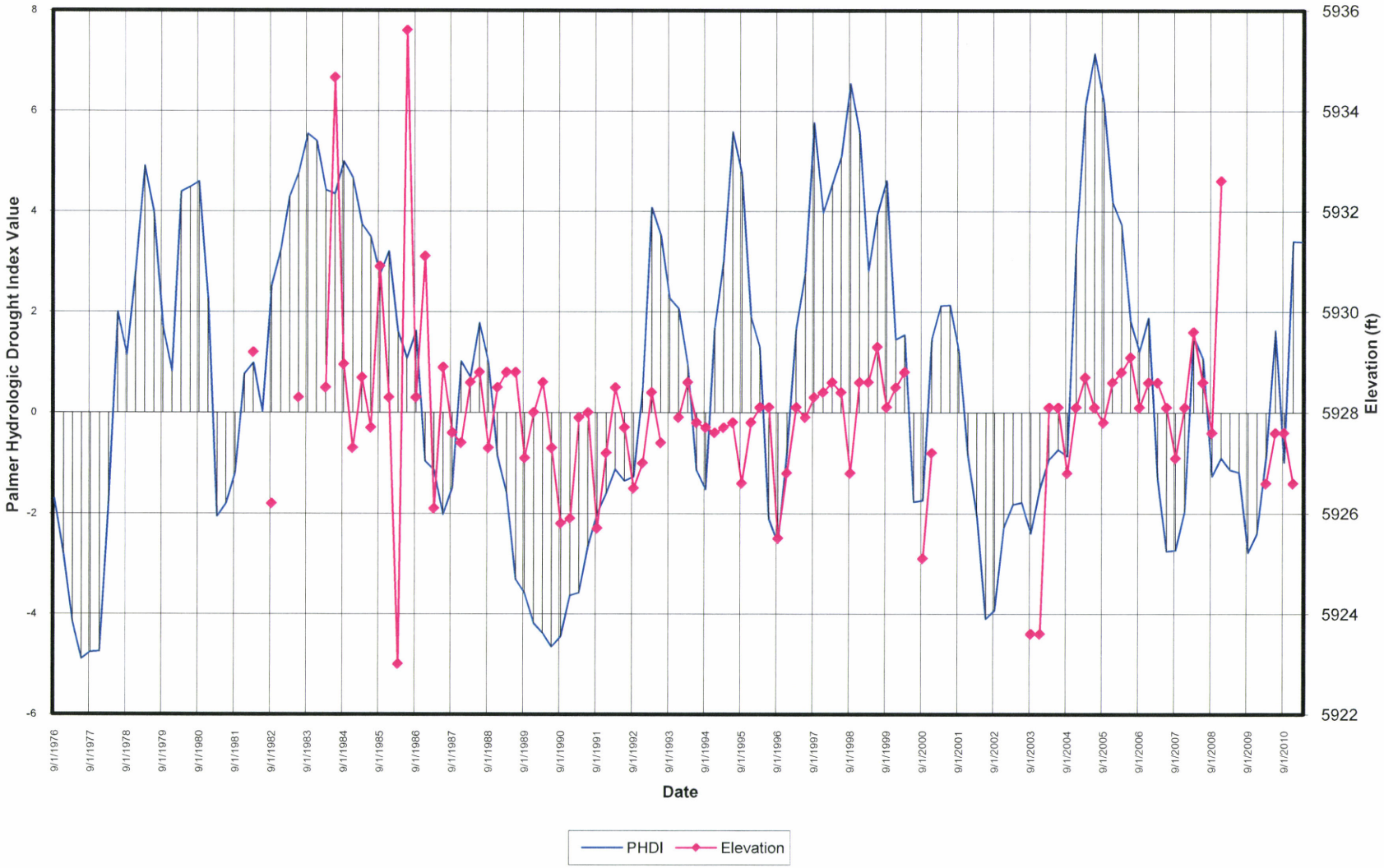
COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL SM1-2



COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL SM1-3



COMPARISION OF ELEVATION AND PALMER HYDROLOGIC DROUGHT INDEX IN ALLUVIUM LAYER AT WELL SM1-4



March 12, 2012

EarthFax

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Mr. John Gefferth
Director, Coal Permitting
Consolidation Coal Company
P.O. Box 566
Sesser, IL 62884-0566

Subject: Emery Mine Monitoring Well R2

Dear John:

On August 22, 2011 I issued a letter outlining recommendations for future groundwater monitoring at the Emery Mine. In that letter, I recommended that some of the wells be dropped from further monitoring due to the presence of oil in the wells. The Utah Division of Oil, Gas and Mining then requested that additional investigations be conducted to assess the nature and chemical composition of the oil in the wells.

One of the wells that we investigated was R-2U, located near the west-central portion of the mine-plan area. This well is completed with nominal 1-inch diameter steel casing to a depth of approximately 550 feet. During this investigation, we lowered a ½-inch diameter bailer into the well, which became stuck in the well. Significant effort to retrieve this bailer proved ineffective and it became necessary to leave the bailer in the well. Hence, it is no longer possible to measure water levels in this well.

Given this condition, we recommend that monitoring well R-2U be dropped from the list of hydrologic monitoring locations at the Emery Mine.

Please contact me if you have any questions.

Sincerely,

Richard B. White, P.E.
President
EarthFax Engineering, Inc.

APPENDIX VI-18

Evaluation of Oil in
Emery Mine Monitoring Wells

Inserted 03/2012

March 12, 2012

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Mr. John Gefferth
Director, Coal Permitting
Consolidation Coal Company
P.O. Box 566
Sesser, IL 62884-0566

Subject: Evaluation of Oil in Emery Mine Monitoring Wells

Dear John:

Pursuant to your request, we have conducted an evaluation of oil in selected monitoring wells at the Emery Mine. The purpose of this evaluation was to address comments from the Utah Division of Oil, Gas and Mining regarding the extent and magnitude of potential hydrocarbon contamination of aquifers at the Emery Mine.

Attachment A presents historic water-level data collected from monitoring wells at the Emery Mine. This table indicates that some of the wells experienced probe-access problems beginning in 2001. With a few of the wells experiencing repeated problems, the decision was made by Mine personnel to pour motor oil into these wells in an attempt to allow easier movement of the probe down the well casing. Unfortunately, this made the collection of future water-level data in those wells difficult since oil would coat the probe and not allow a conductive connection to be made with the water surface. Furthermore, due to cross contamination, it appears that a small amount of oil was introduced into a few of the other wells within the Mine's hydrologic monitoring network. As a result, the monitoring data base indicates that the following groundwater monitoring wells at the Emery Mine (see Figure 1) have occasionally been reported as having oil on the water surface:

- AA-U, AA-M
- H-U, H-M, H-L
- I-B, I-M, I-L
- R2-U
- Lewis

In some cases, the record indicates that oil was present on several occasions. In other cases, the record is sporadic in its indication of oil being present. Except for the Lewis well, each of the above wells is completed with nominal 1-inch diameter galvanized steel casing. The Lewis well is a former private water-supply well that has been abandoned.

To verify the presence or absence of oil in the above wells, we conducted the following investigation:

- Lowered an electronic water-level indicator probe into each well to determine if a water-level measurement could be collected. Upon retrieval, the probe was examined to determine if any oil had collected on the probe or the attached measuring tape.

- Lowered a 1/2-inch diameter polyethylene, disposable, weighted bailer into each well to a depth that intersected the water level. Retrieved the bailer from the well and observed the bailer for indications of the presence of oil (i.e., odor, presence of free oil in the bailer, oil on the surface of the bailer, etc.).
- Sampled the liquids in the bailer. If free oil was present in the bailer, a separate sample of this material was collected. Water samples were analyzed by American West Analytical Laboratories in Salt Lake City, Utah for benzene, ethylbenzene, naphthalene, toulene, and total xylenes. Oil samples were analyzed by Savant, Inc. in Midland, Michigan for kinematic viscosity, simulated distillation by gas chromatography, and elemental analysis by ICP.

General observations made during the field investigation are summarized in Table 1. As indicated, three wells (AA-M, H-M, and H-L) contain noticeable quantities of oil on the water surface, although the exact thickness of oil was difficult to measure because of the small diameter of the wells. Well R2-U may have also contained a noticeable quantity of oil, but the bailer used to sample the oil became stuck in the well during this investigation, making quantification impossible.

The results of laboratory analyses of samples collected during this investigation are summarized in Tables 2 and 3, with analytical reports provided in Attachment B. As indicated in Table 2, no constituents were measured in the groundwater at concentrations that exceeded applicable drinking-water standards. Hence, contamination of groundwater due to the presence of oil in the wells is not considered to be problematic. The results presented in Table 3 indicate that the properties of the oil are consistent with motor oil. Thus, it is apparent that this oil did not originate from a spill, a leak, or other mine operations but rather was new motor oil poured into the wells as indicated by Mine personnel.

It appears that the oil in the wells is not causing contamination of the aquifer and presents only logistical problems for the hydrologic monitoring program. Given this condition, I do not consider it necessary to take any immediate action concerning these wells, but recommend that they be abandoned at some future date in accordance with the requirements of the Utah Division of Water Rights that are then in force.

Please contact me if you have any questions.

Sincerely,

Richard B. White, P.E.
President
EarthFax Engineering, Inc.

TABLE 1

Status of Oil in Emery Mine
Groundwater Monitoring Wells[a]

Well	Status	Result
AA-U	Depth to water = 111 ft. No visible oil on the probe. Water sample collected for laboratory analyses. No visible oil in the bailer.	No oil in this well.
AA-M	Depth to water = 97 ft. Probe and bottom of tape was coated with oil. Oil on the tape may be due to coating of the well casing rather than oil standing in the well. Looks and smells like motor oil. Collected a sample of the oil.	Unknown quantity of oil in this well.
H-U	Depth to water = 96 ft. No visible oil on the probe. Water sample collected for laboratory analyses. No visible oil in the bailer.	No oil in this well.
H-M	Depth to water = 439 ft. Probe and bottom 200 ft of tape was coated with oil. Oil on the tape may be due to coating of the well casing rather than oil standing in the well. Looks and smells like motor oil. Bailer could not be lowered to the water surface. Collected a sample of the oil that coated the tape.	Unknown quantity of oil in this well.
H-L	Depth to water = 108 ft. Probe and bailer coated with oil. Looks and smells like motor oil. Oil appears to be about 2 to 3 ft thick.	2 to 3 ft of oil in this well.
I-B	Depth to water = 127 ft. No visible oil on the probe. Water sample collected for laboratory analyses. No visible oil in the bailer.	No oil in this well.
I-M	Depth to water = 427 ft. No visible oil on the probe. Bailer could not be lowered to the water surface.	No oil in this well.
I-L	Depth to water = 16 ft. No visible oil on the probe. Water sample collected for laboratory analyses. No visible oil in the bailer.	No oil in this well.
R2-U	Depth to water = 542 ft. Probe covered with oil. Bailer became stuck in the well during sampling attempt. Unable to determine thickness of oil in the well. Looks and smells like motor oil.	Unknown quantity of oil in this well.
Lewis	This well is sealed at the surface and no longer accessible. Could not verify the presence or absence of oil.	Well could not be evaluated.

[a] Based on data collected 24 Jan 2012

TABLE 2

Results of Water Analyses

Analyte	Units	Monitoring Well					Drinking Water Std.
		AA-U	H-U	H-L	I-BG	I-L	
Benzene	mg/L	<0.00100	<0.00100	**0.00119**	**0.00204**	<0.00100	0.005
Ethylbenzene	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.7
Naphthalene	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	--
Toluene	mg/L	<0.00200	<0.00200	<0.00200	**0.00465**	<0.00200	1.0
Xylenes, Total	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	10

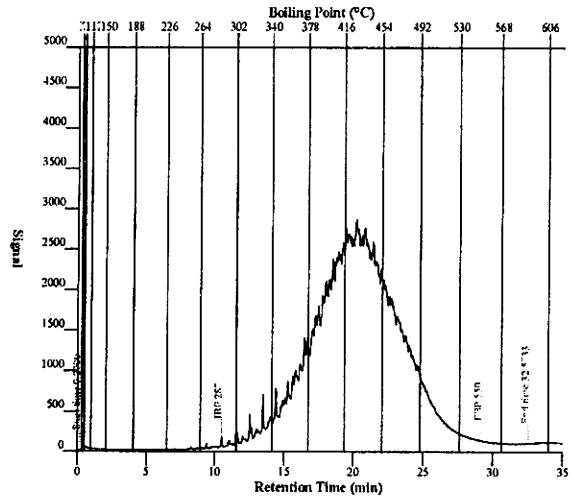
Note: Detected analytes are bolded.

TABLE 3

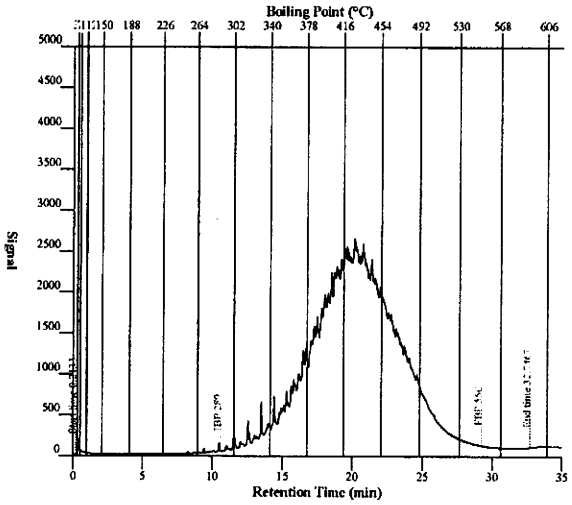
Results of Oil Analyses

Analyte	Units	Monitoring Well			
		AA-M	H-U	H-M	H-L
Kinematic Viscosity @ 40°C	cSt	31.89	0.6718	31.29	0.6666
Kinematic Viscosity @ 100°C	cSt	5.318	--	5.278	--
% Volatilized @ 371°C	Percent	11.0	--	11.0	--

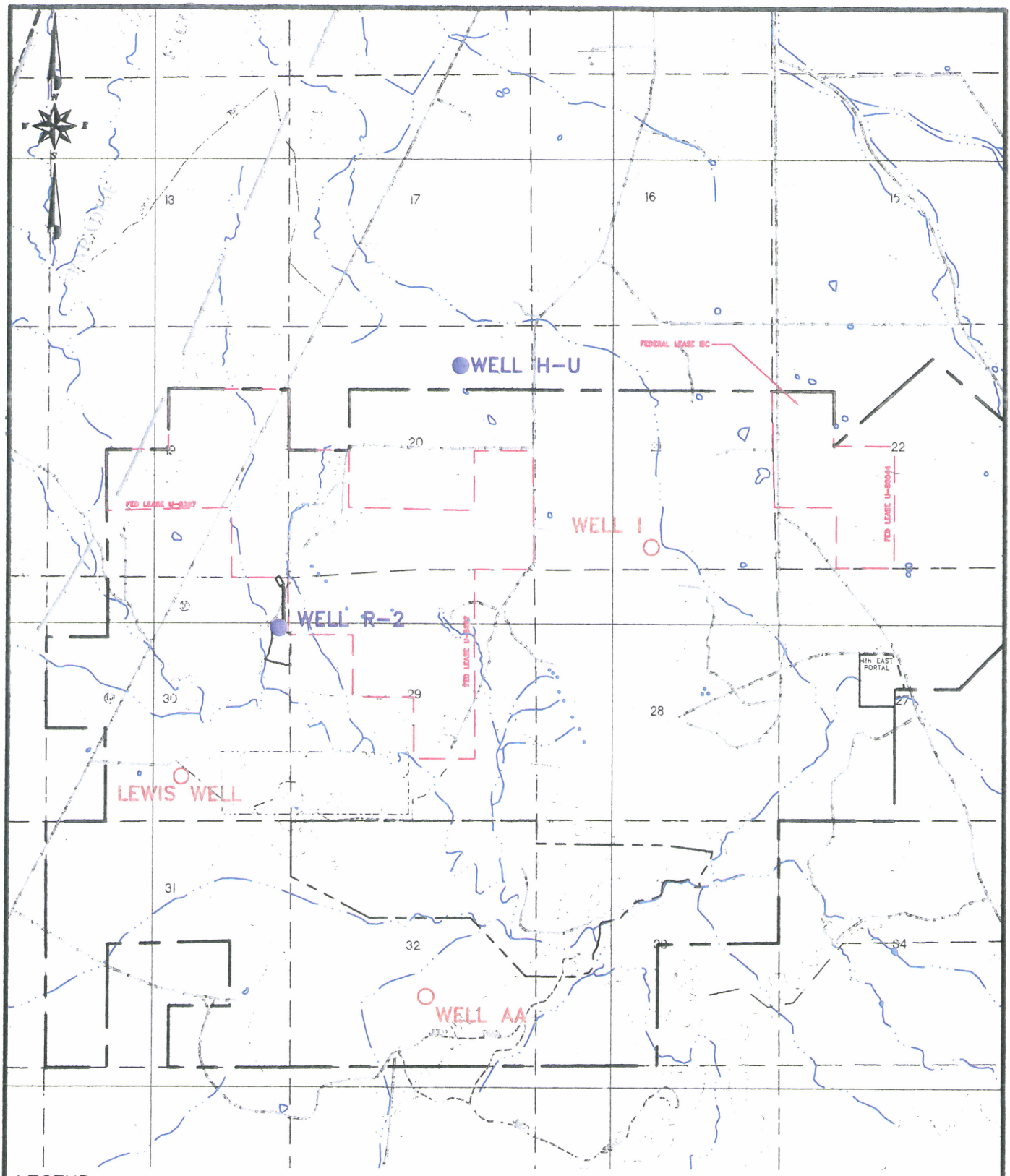
Gas chromatogram of AA-M oil sample:



Gas chromatogram of H-M oil sample:



Conclusion: The kinematic viscosity of the oil is consistent with SAE 20 oil or degraded SAE 30 oil. The gas chromatograms are relatively smooth and consistent between samples, indicating that only one product was introduced into the wells and that this product was the same between wells. The boiling points are consistent with motor oil. It is therefore concluded that the product in the wells is motor oil.



LEGEND

- GROUND WATER MONITORING WELL– PERIODIC STATIC WATER LEVELS
- INACTIVE WELL

0' 3000'

FIGURE 1. WELLS SAMPLED IN OIL INVESTIGATION

EarthFax

G:\UC982 Hydrology monitoring program\FIG 1OIL.dwg, 3/13/2012 5:02:07 PM

John Gefferth
March 12, 2012

ATTACHMENT A

Historic Water-Level Data

Historic water level measurements in "oily" monitoring wells
Emery Mine, Consolidation Coal Company

SITE NAME	DATE	Depth feet	COMMENTS
AA-M	9/28/2011	No Access	Oil in Well
AA-M	6/8/2011	No Access	Oil in well
AA-M	3/28/2011	No Access	OIL IN WELL
AA-M	11/24/2010	No Access	
AA-M	7/20/2010	0	Oil in well
AA-M	6/22/2010	No Access	Oil in well
AA-M	3/24/2010	No Access	Oil in Well
AA-M	12/29/2009	No Access	No Access
AA-M	12/15/2009	No Access	Oil in well
AA-M	12/12/2008	0	Oil in Well
AA-M	9/22/2008	0	Oil in Well
AA-M	6/24/2008	0	Oil in Well
AA-M	3/26/2008	0	Oil in well
AA-M	12/10/2007	0	Oil in well
AA-M	9/20/2007	0	Oil in well
AA-M	6/13/2007	97	
AA-M	3/20/2007	0	OIL IN THE WELL
AA-M	11/20/2006	0	Oil in well
AA-M	9/27/2006	0	Oil in well
AA-M	6/29/2006	100	Oil in Well
AA-M	3/6/2006	96.9	Oil in Well.
AA-M	11/28/2005	97.1	
AA-M	7/8/2005	97.3	
AA-M	5/23/2005	97.3	
AA-M	3/31/2005	97.5	
AA-M	12/27/2004	96.9	Oil in Well
AA-M	9/23/2004	96.75	
AA-M	6/23/2004	89.3	
AA-M	3/30/2004	89.6	
AA-M	12/19/2003	86	
AA-M	9/18/2003	84.75	
AA-M	6/25/2003	89.5	
AA-M	3/26/2003	89.5	
AA-M	12/21/2002	91.58	
AA-M	9/28/2002	91	
AA-M	6/24/2002	90.3	
AA-M	3/27/2002	91.2	
AA-M	12/17/2001	No Access	
AA-M	9/12/2001	90	
AA-M	6/13/2001	87.8	
AA-M	3/23/2001	86.2	
AA-M	3/15/1999	88.5	
AA-M	12/7/1998	88.8	
AA-M	9/16/1998	88.5	
AA-M	6/26/1998	87.800003	
AA-M	3/24/1998	88.5	
AA-M	12/18/1997	92.7	
AA-M	9/29/1997	89.800003	
AA-M	6/20/1997	90.2231	
AA-M	3/21/1997	90.715226	
AA-M	12/5/1996	90.2	
AA-M	9/9/1996	89.9	
AA-M	6/4/1996	88.9	
AA-M	12/5/1995	90.5	
AA-M	9/5/1995	92.7	
AA-M	6/7/1995	92.5	
AA-M	3/3/1995	92.8	
AA-M	12/1/1994	91.3	
AA-M	9/9/1994	92.2	
AA-M	6/7/1994	90.3	
AA-M	3/9/1994	91.1	
AA-M	12/7/1993	87.2	
AA-M	9/8/1993	90	
AA-M	6/2/1993	87.6	
AA-M	3/22/1993	85.3	
AA-M	3/13/1992	89	
AA-M	6/22/1981	-120.4	

SITE NAME	DATE	Depth feet	COMMENTS
AA-U	9/28/2011	110.5	
AA-U	6/8/2011	111	
AA-U	3/28/2011	111	
AA-U	11/24/2010	111	
AA-U	7/20/2010	111	
AA-U	6/22/2010	111	
AA-U	3/25/2010	11	
AA-U	12/29/2009	112	
AA-U	12/15/2009	112	
AA-U	6/3/2009	113	
AA-U	12/12/2008	111	
AA-U	9/22/2008	11	
AA-U	6/24/2008	111	
AA-U	3/26/2008	110	
AA-U	12/10/2007	111	
AA-U	9/20/2007	111	
AA-U	6/13/2007	110.5	
AA-U	3/20/2007	110	
AA-U	11/20/2006	111	
AA-U	9/27/2006	91	
AA-U	6/29/2006	110.4	
AA-U	3/6/2006	110.4	
AA-U	11/28/2005	111	
AA-U	7/8/2005	108.8	
AA-U	5/23/2005	110.7	Oil in Well
AA-U	3/31/2005	111	
AA-U	12/27/2004	111	
AA-U	9/23/2004	111.1	
AA-U	6/23/2004	112.1	
AA-U	3/30/2004	112.1	
AA-U	12/19/2003	112	
AA-U	9/18/2003	111.7	
AA-U	6/25/2003	118	
AA-U	3/26/2003	111.67	
AA-U	12/21/2002	113.92	
AA-U	9/28/2002	112.33	
AA-U	6/24/2002	111.8	
AA-U	3/27/2002	114.9	
AA-U	12/17/2001	No Access	
AA-U	9/12/2001	111.8	
AA-U	6/13/2001	111.2	
AA-U	3/23/2001	110.7	
AA-U	3/15/1999	112.2	
AA-U	12/7/1998	112.5	
AA-U	9/16/1998	112.6	
AA-U	6/26/1998	112.5	
AA-U	3/24/1998	113	
AA-U	12/18/1997	112.8	
AA-U	9/29/1997	111.8	
AA-U	6/20/1997	112.20473	
AA-U	3/21/1997	111.54856	
AA-U	12/5/1996	110.8	
AA-U	9/9/1996	111.5	
AA-U	6/4/1996	113.9	
AA-U	12/5/1995	113	
AA-U	9/5/1995	112.8	
AA-U	6/7/1995	112.7	
AA-U	3/3/1995	112.6	
AA-U	12/1/1994	112.3	
AA-U	9/9/1994	112.8	
AA-U	6/7/1994	112.4	
AA-U	3/9/1994	113	
AA-U	12/7/1993	113.1	
AA-U	9/8/1993	113	
AA-U	6/2/1993	112.5	
AA-U	3/22/1993	112.6	
AA-U	3/13/1992	111.2	

SITE NAME	DATE	Depth feet	COMMENTS
AA-M	5/11/1981	-21.54	
AA-M	4/11/1981	-23.15	
AA-M	3/16/1981	-22.92	
AA-M	2/9/1981	-21.77	
AA-M	1/8/1981	-21.07	
AA-M	12/9/1980	-21.77	
AA-M	11/7/1980	-21.3	
AA-M	10/13/1980	-21.77	
AA-M	9/17/1980	-22.69	
AA-M	8/11/1980	-21.69	
AA-M	7/16/1980	-18.22	
AA-M	6/11/1980	-18.22	
AA-M	5/21/1980	-25.15	
AA-M	4/19/1980	-25.15	
AA-M	3/17/1980	-22.84	
AA-M	11/16/1979	-2.23	

SITE NAME	DATE	Depth feet	COMMENTS
AA-U	7/23/1981	38.04	
AA-U	6/22/1981	-22.91	
AA-U	5/11/1981	-123.27	
AA-U	4/11/1981	-127.19	
AA-U	3/16/1981	-135.73	
AA-U	2/9/1981	-136.39	
AA-U	1/8/1981	-136.63	
AA-U	12/9/1980	-135.01	
AA-U	11/7/1980	-136.39	
AA-U	10/13/1980	-136.86	
AA-U	9/16/1980	-136.96	
AA-U	8/12/1980	-137.71	
AA-U	7/16/1980	-141.17	
AA-U	6/11/1980	-141.17	
AA-U	5/21/1980	-141.17	
AA-U	4/19/1980	-118.1	
AA-U	3/17/1980	-118.1	

SITE NAME	DATE	Depth feet	COMMENTS
H-L	9/27/2011	No Access	Oil in Well
H-L	6/21/2011	No Access	Oil in well
H-L	3/29/2011	No Access	OIL IN WELL
H-L	11/24/2010	No Access	
H-L	7/20/2010	No Access	oil in well
H-L	6/22/2010	No Access	Oil in well
H-L	3/24/2010	No Access	Oil in well
H-L	12/29/2009	No Access	Oil in well
H-L	12/14/2009	No Access	Oil in well
H-L	12/12/2008	0	Oil in Well
H-L	9/20/2008	0	Oil in Well
H-L	6/24/2008	0	Oil in well
H-L	3/28/2008	0	Oil in well
H-L	12/11/2007	0	Oil in well
H-L	9/20/2007	51	
H-L	6/14/2007	0	
H-L	3/20/2007	0	
H-L	11/27/2006	0	
H-L	9/27/2006	0	Oil in well
H-L	6/29/2006	81	Oil in Well
H-L	3/9/2006	80.2	Oil in Well.
H-L	11/22/2005	80.8	Oil in well
H-L	7/11/2005	80.5	Oil in Well
H-L	5/23/2005	Dry Wells	Oil in Well
H-L	3/25/2005	Dry Wells	Oil in Well
H-L	12/28/2004	Dry Wells	Oil in well depth unknown
H-L	9/25/2004	0	
H-L	6/18/2004	80.3	
H-L	3/30/2004	84.3	
H-L	12/19/2003	19.7	
H-L	9/17/2003	0	Too Oily Probe Wont Read
H-L	5/28/2003	89	
H-L	3/14/2003	79.17	
H-L	12/21/2002	84.33	
H-L	9/23/2002	83.75	
H-L	6/27/2002	83.9	
H-L	3/21/2002	82	
H-L	12/12/2001	84.3	
H-L	9/12/2001	84.2	
H-L	6/13/2001	83.8	
H-L	3/22/2001	80.8	
H-L	3/15/1999	82.8	
H-L	12/10/1998	84	
H-L	9/16/1998	83.4	
H-L	6/26/1998	83.9	
H-L	3/31/1998	82.9	
H-L	12/16/1997	83.5	
H-L	9/29/1997	84.200003	
H-L	6/20/1997	84.317588	
H-L	3/6/1997	83.595803	

SITE NAME	DATE	Depth feet	COMMENTS
H-M	9/27/2011	No Access	Oil in Well
H-M	6/21/2011	No Access	Oil in well
H-M	3/29/2011	No Access	OIL IN WELL
H-M	11/24/2010	No Access	
H-M	7/20/2010	No Access	oil in well
H-M	6/22/2010	No Access	Oil in well
H-M	3/24/2010	No Access	Oil in well
H-M	12/29/2009	No Access	Oil in well
H-M	12/14/2009	No Access	Oil in well
H-M	6/3/2009	No Access	Oil in well
H-M	12/12/2008	0	Oil in Well
H-M	9/20/2008	0	Oil in Well
H-M	6/24/2008	0	Oil in well
H-M	3/28/2008	0	Oil in well
H-M	12/11/2007	0	Oil in well
H-M	9/20/2007	0	Oil in well
H-M	6/14/2007	0	
H-M	3/20/2007	0	OIL IN THE WELL
H-M	11/27/2006	0	Oil in well
H-M	9/27/2006	0	Oil in well
H-M	6/29/2006	321	
H-M	3/9/2006	300	Oil in Well.
H-M	11/22/2005	0	Oil in well could not get a reading
H-M	7/11/2005	0	Oil in Well will not read depth
H-M	5/23/2005	Dry Wells	Oil in Well
H-M	3/25/2005	Dry Wells	Oil in Well
H-M	12/28/2004	Dry Wells	Oil in well depth unknown
H-M	9/25/2004	0	
H-M	6/18/2004	416	
H-M	3/30/2004	414.8	
H-M	12/19/2003	415	
H-M	9/17/2003	414	Oily
H-M	5/28/2003	409	
H-M	3/14/2003	417	
H-M	12/21/2002	414.83	
H-M	9/23/2002	412.2	
H-M	6/27/2002	412.3	
H-M	3/21/2002	409.9	
H-M	12/12/2001	415.1	
H-M	9/12/2001	414.8	
H-M	6/13/2001	412.7	
H-M	3/22/2001	404	
H-M	3/15/1999	413.2	
H-M	12/10/1998	416.5	
H-M	9/16/1998	417	
H-M	6/26/1998	413.5	
H-M	3/31/1998	413.7	
H-M	12/16/1997	414.2	
H-M	9/29/1997	409.90001	
H-M	6/20/1997	410.105	

SITE NAME	DATE	Depth feet	COMMENTS
H-L	12/27/1996	83.7	
H-L	9/9/1996	83.4	
H-L	6/10/1996	83.1	
H-L	12/6/1995	84.7	
H-L	9/11/1995	91	
H-L	6/7/1995	81	
H-L	3/2/1995	80.8	
H-L	12/1/1994	81.8	
H-L	9/9/1994	80.3	
H-L	6/8/1994	81.2	
H-L	3/8/1994	80	
H-L	12/8/1993	77.5	
H-L	9/10/1993	78.5	
H-L	6/2/1993	75.8	
H-L	3/4/1993	75.1	
H-L	3/13/1992	71.5	
H-L	1/14/1985	19.6	
H-L	6/22/1981	-21.91	
H-L	5/11/1981	-22.14	
H-L	4/11/1981	-21.91	
H-L	3/16/1981	-23.87	
H-L	2/9/1981	-38.26	
H-L	1/9/1981	-23.27	
H-L	12/10/1980	-17.5	
H-L	11/8/1980	-22.11	
H-L	10/13/1980	-15.42	
H-L	9/17/1980	-10.27	
H-L	8/11/1980	-11.43	
H-L	7/15/1980	-16.04	
H-L	6/10/1980	-16.04	
H-L	5/21/1980	-16.04	
H-L	4/18/1980	-16.04	
H-L	3/14/1980	-16.04	
H-L	11/15/1979	-13	
H-L	10/24/1979	-13.5	

SITE NAME	DATE	Depth feet	COMMENTS
H-M	3/6/1997	409.90815	
H-M	12/27/1996	410.4	
H-M	9/9/1996	408.5	
H-M	6/10/1996	412.8	
H-M	12/6/1995	414.9	
H-M	9/11/1995	415.2	
H-M	6/7/1995	411.2	
H-M	3/2/1995	406	
H-M	12/1/1994	406.2	
H-M	9/9/1994	405.2	
H-M	6/8/1994	410.6	
H-M	3/8/1994	405.1	
H-M	12/8/1993	402.1	
H-M	9/10/1993	405.3	
H-M	6/2/1993	399.2	
H-M	3/4/1993	400	
H-M	3/13/1992	392.8	
H-M	1/14/1985	59.9	
H-M	6/22/1981	-21.24	
H-M	5/11/1981	-23.55	
H-M	4/11/1981	-25.86	
H-M	3/16/1981	-22.39	
H-M	2/9/1981	-22.39	
H-M	1/9/1981	-23.31	
H-M	12/10/1980	-23.31	
H-M	11/8/1980	-24.24	
H-M	10/13/1980	-22.85	
H-M	9/17/1980	-19.18	
H-M	8/11/1980	-20.63	
H-M	7/15/1980	-20.63	
H-M	6/10/1980	-25.25	
H-M	5/21/1980	-25.25	
H-M	4/18/1980	-25.25	
H-M	3/14/1980	-25.25	
H-M	11/15/1979	-25	
H-M	10/24/1979	-60	

SITE NAME	DATE	Depth feet	COMMENTS
H-U	9/27/2011	90.5	
H-U	6/21/2011	90.8	
H-U	3/29/2011	88	
H-U	11/24/2010	85	
H-U	7/21/2010	80	
H-U	6/23/2010	80	
H-U	3/25/2010	80	
H-U	12/29/2009	70	
H-U	12/14/2009	69	
H-U	6/3/2009	69	
H-U	12/12/2008	65	
H-U	9/20/2008	54	
H-U	6/24/2008	60	hit oil
H-U	3/28/2008	56	
H-U	12/10/2007	53	
H-U	9/20/2007	51	
H-U	6/14/2007	47	
H-U	3/20/2007	43.5	
H-U	11/27/2006	39	
H-U	9/27/2006	38.5	
H-U	6/29/2006	36	
H-U	3/9/2006	34.8	
H-U	11/22/2005	32.4	
H-U	7/11/2005	32.5	
H-U	5/23/2005	59.7	
H-U	3/25/2005	41.4	
H-U	12/28/2004	53.5	
H-U	9/25/2004	61.75	
H-U	6/18/2004	60.6	
H-U	3/30/2004	59.5	
H-U	12/19/2003	62.5	

SITE NAME	DATE	Depth feet	COMMENTS
I-B	9/27/2011	No Access	Oil in Well
I-B	6/8/2011	No Access	Oil in well
I-B	3/29/2011	No Access	OIL IN WELL
I-B	10/15/2010	No Access	
I-B	7/20/2010	No Access	oil in well
I-B	6/22/2010	No Access	Oil in well
I-B	3/24/2010	No Access	Oil in well
I-B	12/29/2009	No Access	Oil in well
I-B	12/14/2009	No Access	Oil in well
I-B	6/3/2009	No Access	Oil in well
I-B	12/12/2008	0	Oil in Well
I-B	9/20/2008	0	Oil in Well
I-B	6/24/2008	0	Oil in well
I-B	3/28/2008	0	Oil in well
I-B	12/10/2007	No Access	Oil in well
I-B	9/20/2007	0	Oil in well
I-B	6/14/2007	0	
I-B	3/20/2007	0	OIL IN WELL
I-B	11/27/2006	0	Oil in well couldn't sample
I-B	9/27/2006	0	Oil in well
I-B	6/29/2006	68.8	Oil in well
I-B	3/9/2006	70	
I-B	11/17/2005	69.9	
I-B	7/20/2005	69.3	
I-B	5/23/2005	Dry Wells	Probe stops at 66 feet
I-B	3/25/2005	Dry Wells	Probe Stops at 66'
I-B	12/28/2004	Dry Wells	Broken pump down
I-B	9/25/2004	66	no water to sample
I-B	6/18/2004	66	probe catches at 66 feet
I-B	3/18/2004	67	
I-B	12/19/2003	66	probe stops at this depth

SITE NAME	DATE	Depth feet	COMMENTS
H-U	9/17/2003	61	Oily
H-U	5/28/2003	56.6	
H-U	3/14/2003	58.25	
H-U	12/21/2002	59.08	
H-U	9/23/2002	57.7	
H-U	6/27/2002	57.7	
H-U	3/21/2002	57.3	
H-U	12/12/2001	58.2	
H-U	9/12/2001	57.8	
H-U	6/13/2001	57.1	
H-U	3/22/2001	56.3	
H-U	3/15/1999	57.4	
H-U	12/10/1998	57.5	
H-U	9/16/1998	57.6	
H-U	6/26/1998	57.8	
H-U	3/31/1998	57.2	
H-U	12/16/1997	58.6	
H-U	9/29/1997	56.800002	
H-U	6/20/1997	56.758532	
H-U	3/6/1997	57.906826	
H-U	12/27/1996	57.5	
H-U	9/9/1996	57.5	
H-U	6/10/1996	57.8	
H-U	12/6/1995	57.9	
H-U	9/11/1995	56.2	
H-U	6/7/1995	57.1	
H-U	3/2/1995	56.1	
H-U	12/1/1994	57.3	
H-U	9/8/1994	57.7	
H-U	6/8/1994	57.7	
H-U	3/8/1994	57.2	
H-U	12/8/1993	56.2	
H-U	9/10/1993	57	
H-U	6/2/1993	57.2	
H-U	3/4/1993	56	
H-U	3/13/1992	57	
H-U	1/14/1985	57.9	
H-U	6/22/1981	53.53	
H-U	5/11/1981	52.65	
H-U	4/11/1981	52.1	
H-U	3/16/1981	55.8	
H-U	2/9/1981	56.67	
H-U	1/9/1981	56.96	
H-U	11/8/1980	60.99	
H-U	10/13/1980	60.75	
H-U	9/16/1980	59.74	
H-U	8/11/1980	60.45	
H-U	7/15/1980	60.2	
H-U	6/10/1980	57.63	
H-U	5/21/1980	56.82	
H-U	4/18/1980	53.68	
H-U	3/14/1980	51.59	
H-U	11/15/1979	64.18	

SITE NAME	DATE	Depth feet	COMMENTS
I-B	9/17/2003	66	Probe stops at 66'
I-B	5/28/2003	No Access	Probe stops a 66'
I-B	3/14/2003	66	Probe stops
I-B	12/21/2002	65.5	Probes Stops
I-B	9/23/2002	66	
I-B	6/27/2002	66	probe stops
I-B	3/21/2002	66	probe stops
I-B	12/12/2001	66	probe sticks at this depth
I-B	9/12/2001	66	
I-B	6/13/2001	66	probe sticks - can't get in any farther
I-B	3/22/2001	66	
I-B	3/17/1999	66	
I-B	12/10/1998	66	
I-B	9/8/1998	68	
I-B	6/26/1998	68	
I-B	3/31/1998	68	
I-B	12/12/1997	65.2	
I-B	9/29/1997	64.900002	
I-B	6/20/1997	65.288716	
I-B	3/6/1997	64.99344	
I-B	12/27/1996	63.5	
I-B	9/9/1996	64.4	
I-B	6/10/1996	61.4	
I-B	12/6/1995	62.7	
I-B	9/11/1995	62.5	
I-B	6/7/1995	62	
I-B	3/2/1995	61.4	
I-B	12/1/1994	60.3	
I-B	9/8/1994	60.2	
I-B	6/7/1994	53.8	
I-B	3/8/1994	56.2	
I-B	12/8/1993	56.4	
I-B	9/9/1993	57	
I-B	6/2/1993	56	
I-B	3/3/1993	55	
I-B	3/13/1992	48.4	
I-B	6/22/1981	10.46	
I-B	5/11/1981	10.25	
I-B	4/11/1981	10.02	
I-B	3/16/1981	9.93	
I-B	2/9/1981	9.31	
I-B	1/9/1981	9.75	
I-B	11/8/1980	9.51	
I-B	10/13/1980	9.78	
I-B	9/17/1980	10.14	
I-B	8/11/1980	10.58	
I-B	7/15/1980	11.01	
I-B	6/10/1980	10.9	
I-B	5/21/1980	11.04	
I-B	4/18/1980	11.05	
I-B	3/14/1980	10.47	
I-B	11/15/1979	11.69	
I-B	10/25/1979	9.56	

SITE NAME	DATE	Depth feet	COMMENTS
I-L	9/27/2011	18.5	
I-L	6/8/2011	18	
I-L	3/29/2011	18	
I-L	10/15/2010	18	
I-L	7/20/2010	18	
I-L	6/23/2010	18	
I-L	3/25/2010	18	
I-L	12/29/2009	18	
I-L	12/14/2009	18	
I-L	6/3/2009	18	
I-L	12/12/2008	18	
I-L	9/22/2008	17	
I-L	6/24/2008	17	Hit oil
I-L	3/28/2008	17	Hit oil

SITE NAME	DATE	Depth feet	COMMENTS
I-M	9/27/2011	No Access	Oil in Well
I-M	6/8/2011	No Access	Oil in well
I-M	3/29/2011	No Access	OIL IN WELL
I-M	10/5/2010	No Access	
I-M	7/20/2010	No Access	oil in well
I-M	6/22/2010	No Access	Oil in well
I-M	3/24/2010	No Access	Oil in Well
I-M	12/29/2009	No Access	Oil in well
I-M	12/14/2009	No Access	Oil in well
I-M	12/12/2008	0	Oil in Well
I-M	9/20/2008	0	Oil in Well
I-M	6/24/2008	395	
I-M	3/28/2008	394	
I-M	12/10/2007	394	

SITE NAME	DATE	Depth feet	COMMENTS
I-L	12/10/2007	18	
I-L	9/20/2007	395	
I-L	6/14/2007	13	
I-L	3/20/2007	17	
I-L	11/27/2006	17	
I-L	9/27/2006	17.5	
I-L	6/29/2006	18.3	
I-L	3/9/2006	17.6	
I-L	11/17/2005	18	
I-L	7/20/2005	18.8	
I-L	5/23/2005	18.3	
I-L	3/25/2005	19.1	
I-L	12/28/2004	18.6	
I-L	9/26/2004	19	
I-L	6/18/2004	18.5	
I-L	3/18/2004	21	
I-L	12/19/2003	21.2	
I-L	9/17/2003	19.7	
I-L	5/28/2003	20	
I-L	3/14/2003	16	
I-L	12/21/2002	16	
I-L	9/23/2002	16.75	
I-L	6/27/2002	17.8	
I-L	3/21/2002	18	
I-L	12/12/2001	15.8	
I-L	9/12/2001	15.5	
I-L	6/13/2001	15.2	
I-L	3/22/2001	17.9	
I-L	3/17/1999	15.1	
I-L	12/10/1998	15	
I-L	9/8/1998	14	
I-L	6/26/1998	15.1	
I-L	3/31/1998	14	
I-L	12/12/1997	14.2	
I-L	9/29/1997	15.4	
I-L	6/20/1997	15.419948	
I-L	3/6/1997	15.485565	
I-L	12/27/1996	15.8	
I-L	9/9/1996	15	
I-L	6/10/1996	15.5	
I-L	12/6/1995	15.8	
I-L	9/11/1995	17.1	
I-L	6/7/1995	17.1	
I-L	3/2/1995	17	
I-L	12/1/1994	17.3	
I-L	9/8/1994	16.2	
I-L	6/7/1994	16.8	
I-L	3/8/1994	16.7	
I-L	12/8/1993	16.1	
I-L	9/9/1993	16.5	
I-L	6/2/1993	16.9	
I-L	3/3/1993	16.8	
I-L	3/13/1992	13.4	
I-L	6/22/1981	0.37	
I-L	5/11/1981	-0.11	
I-L	4/11/1981	-0.3	
I-L	3/16/1981	-0.47	
I-L	11/18/1980	-1.35	
I-L	10/13/1980	-1.4	
I-L	8/11/1980	-1.07	
I-L	7/17/1980	-1.4	
I-L	7/16/1980	-1.4	
I-L	6/10/1980	-1.4	
I-L	5/21/1980	-1.4	
I-L	4/18/1980	-1.4	
I-L	3/14/1980	-1.4	
I-L	11/15/1979	-1.33	
I-L	10/30/1979	11.33	

SITE NAME	DATE	Depth feet	COMMENTS
I-M	9/20/2007	13	
I-M	6/14/2007	396	
I-M	3/20/2007	396	
I-M	11/27/2006	395	
I-M	9/27/2006	395	
I-M	6/29/2006	393.6	
I-M	3/9/2006	390.9	
I-M	11/22/2005	389	
I-M	7/20/2005	237.8	
I-M	5/23/2005	233.8	
I-M	3/25/2005	234.6	
I-M	12/28/2004	262	
I-M	9/25/2004	262.9	
I-M	6/18/2004	240.2	
I-M	3/30/2004	249.3	
I-M	12/19/2003	262	
I-M	9/17/2003	263	
I-M	5/28/2003	242.4	
I-M	3/14/2003	240.5	
I-M	12/21/2002	239.33	
I-M	9/23/2002	238.8	
I-M	6/27/2002	238	
I-M	3/21/2002	238.1	
I-M	12/12/2001	238.8	
I-M	9/12/2001	238.9	
I-M	6/13/2001	237.6	
I-M	3/22/2001	237.3	
I-M	3/17/1999	238.2	
I-M	12/10/1998	237.7	
I-M	9/8/1998	238.2	
I-M	6/26/1998	239.5	
I-M	3/31/1998	237.8	
I-M	12/12/1997	239.2	
I-M	9/29/1997	240.00001	
I-M	6/20/1997	239.50132	
I-M	3/6/1997	240.48557	
I-M	12/27/1996	241.2	
I-M	9/9/1996	240.7	
I-M	6/10/1996	241.3	
I-M	12/6/1995	242.2	
I-M	9/11/1995	242.2	
I-M	6/7/1995	242.3	
I-M	3/2/1995	242.8	
I-M	12/1/1994	243.8	
I-M	9/8/1994	244.1	
I-M	6/7/1994	243.4	
I-M	3/8/1994	242.7	
I-M	12/8/1993	236.8	
I-M	9/9/1993	237.5	
I-M	6/2/1993	238.4	
I-M	3/3/1993	237.2	
I-M	3/13/1992	233.1	
I-M	6/22/1981	105.9	
I-M	5/11/1981	109.56	
I-M	4/11/1981	111.78	
I-M	3/16/1981	112.43	
I-M	2/9/1981	113.7	
I-M	1/9/1981	115.36	
I-M	11/8/1980	80.98	
I-M	10/13/1980	80.08	
I-M	9/17/1980	79.57	
I-M	8/11/1980	77.9	
I-M	7/15/1980	75.62	
I-M	6/10/1980	74.06	
I-M	5/21/1980	72.93	
I-M	4/18/1980	70.94	
I-M	3/14/1980	68.18	
I-M	11/15/1979	51.14	
I-M	10/25/1979	62.25	

SITE NAME	DATE	Depth feet	COMMENTS
LEWIS-U	9/22/2011	No Access	
LEWIS-U	6/8/2011	No Access	
LEWIS-U	3/28/2011	No Access	
LEWIS-U	11/24/2010	No Access	
LEWIS-U	7/20/2010	No Access	
LEWIS-U	6/22/2010	No Access	Oil in well
LEWIS-U	3/25/2010	No Access	No Access
LEWIS-U	12/14/2009	No Access	No Access
LEWIS-U	6/3/2009	No Access	No Access
LEWIS-U	2/25/2009	No Access	No Access
LEWIS-U	12/12/2008	No Access	No Access
LEWIS-U	9/22/2008	No Access	No Access
LEWIS-U	6/24/2008	No Access	
LEWIS-U	3/26/2008	No Access	
LEWIS-U	12/10/2007	No Access	
LEWIS-U	9/20/2007	0	No access
LEWIS-U	6/13/2007	No Access	
LEWIS-U	3/22/2007	No Access	
LEWIS-U	11/20/2006	0	No Access to the hole
LEWIS-U	9/27/2006	0	No access to sample
LEWIS-U	6/29/2006	No Access	No Access to sample
LEWIS-U	3/6/2006	No Access	No access to sample.
LEWIS-U	11/28/2005	No Access	No access to the well
LEWIS-U	7/22/2005	Dry Wells	Well is 276 ft. deep and Dry
LEWIS-U	5/23/2005	Dry Wells	
LEWIS-U	3/31/2005	Dry Wells	
LEWIS-U	12/27/2004	Dry Wells	Site was dry
LEWIS-U	9/25/2004	215	Not enough water to sample
LEWIS-U	6/18/2004	215	probe hangs up
LEWIS-U	3/29/2004	215	probe stops at 215 feet
LEWIS-U	12/19/2003	275	
LEWIS-U	9/17/2003	275	Dry
LEWIS-U	6/12/2003	Dry Wells	Plugged @ 216'
LEWIS-U	3/13/2003	216	Probe Stops
LEWIS-U	12/21/2002	Dry Wells	probe pipe plugged at 215 feet
LEWIS-U	9/24/2002	215	
LEWIS-U	6/24/2002		
LEWIS-U	3/27/2002	215	probe stops
LEWIS-U	12/17/2001		probe sticks at this point
LEWIS-U	9/5/2001		DIS.METALS FILTERED @ LAB
LEWIS-U	6/5/2001		DIS.METALS FILTERED @ LAB
LEWIS-U	3/23/2001	215	
LEWIS-U	6/13/2000		
LEWIS-U	3/15/1999		
LEWIS-U	12/10/1998		
LEWIS-U	9/8/1998	281.2	
LEWIS-U	6/2/1998	281.2	
LEWIS-U	3/24/1998		
LEWIS-U	12/18/1997		
LEWIS-U	9/8/1997	280.900009	
LEWIS-U	6/3/1997	279.855652	
LEWIS-U	3/5/1997	278.805783	
LEWIS-U	12/5/1996	278.3	
LEWIS-U	9/4/1996	270	
LEWIS-U	6/4/1996	275	
LEWIS-U	12/5/1995		
LEWIS-U	9/5/1995		
LEWIS-U	9/5/1995	271	
LEWIS-U	6/6/1995		
LEWIS-U	6/6/1995	270.8	
LEWIS-U	3/2/1995	271.1	
LEWIS-U	12/1/1994	271.1	
LEWIS-U	9/7/1994		
LEWIS-U	9/7/1994	270.3	
LEWIS-U	6/6/1994		
LEWIS-U	6/6/1994	268.8	
LEWIS-U	3/8/1994	268.5	
LEWIS-U	12/7/1993	267	
LEWIS-U	9/7/1993		

SITE NAME	DATE	Depth feet	COMMENTS
R2-U	9/27/2011	497	
R2-U	6/21/2011	510.11	
R2-U	3/25/2011	506.8	
R2-U	10/15/2010	510	
R2-U	7/19/2010	503	
R2-U	6/23/2010	500	
R2-U	3/25/2010	505	
R2-U	12/29/2009	535	
R2-U	12/14/2009	532	
R2-U	6/3/2009	532	
R2-U	12/12/2008	550	
R2-U	9/20/2008	562	
R2-U	6/24/2008	570	
R2-U	3/26/2008	567	
R2-U	12/10/2007	575	Dry
R2-U	9/18/2007	537	
R2-U	6/14/2007	563	
R2-U	3/20/2007	488	
R2-U	11/20/2006	488	
R2-U	9/28/2006	488	
R2-U	6/29/2006	Dry Wells	491.0' deep and dry
R2-U	3/7/2006	531	Oil in Well.
R2-U	11/28/2005	550.7	
R2-U	7/11/2005	602.6	Oil in Well
R2-U	5/23/2005	Dry Wells	438 Feet and dry
R2-U	3/24/2005	Dry Wells	
R2-U	12/28/2004	Dry Wells	Site was dry at 488'
R2-U	9/20/2004	0	Site was dry
R2-U	6/23/2004	488	
R2-U	3/18/2004	0	dry
R2-U	12/19/2003	488	
R2-U	9/17/2003	488	Dry
R2-U	5/28/2003	Dry Wells	Well dry at 488'
R2-U	3/14/2003	487	
R2-U	12/21/2002	488	
R2-U	9/28/2002	0	
R2-U	6/27/2002	487	
R2-U	3/1/2002	487	
R2-U	12/17/2001	487	
R2-U	9/12/2001	487	
R2-U	6/13/2001	487	
R2-U	3/22/2001	487	
R2-U	3/15/1999		
R2-U	12/10/1998		
R2-U	9/15/1998		
R2-U	6/26/1998		
R2-U	3/31/1998		
R2-U	12/5/1997		
R2-U	9/30/1997		
R2-U	6/20/1997		
R2-U	3/3/1997		
R2-U	12/5/1996	Dry Wells	
R2-U	9/9/1996		
R2-U	6/10/1996		
R2-U	12/5/1995		
R2-U	9/7/1995		
R2-U	6/1/1995		
R2-U	3/2/1995		
R2-U	12/1/1994		
R2-U	9/8/1994		
R2-U	6/7/1994		
R2-U	3/8/1994		
R2-U	12/7/1993		
R2-U	9/9/1993		dry to 487 feet
R2-U	6/4/1993		dry to 487 feet
R2-U	3/3/1993		dry to 487 feet
R2-U	3/13/1992		
R2-U	1/14/1985		
R2-U	6/22/1981	-36.17	

SITE NAME	DATE	Depth feet	COMMENTS
LEWIS-U	9/7/1993	264	
LEWIS-U	6/7/1993		
LEWIS-U	6/2/1993	263.8	
LEWIS-U	3/3/1993	264.1	
LEWIS-U	9/2/1992	266	
LEWIS-U	5/26/1992		
LEWIS-U	3/13/1992	263.4	
LEWIS-U	9/23/1991		
LEWIS-U	6/5/1991		
LEWIS-U	9/17/1990	-17	
LEWIS-U	6/8/1990	261	
LEWIS-U	9/11/1989	257.7	
LEWIS-U	6/30/1989	261	
LEWIS-U	6/24/1986		
LEWIS-U	9/19/1985		
LEWIS-U	6/20/1985		

SITE NAME	DATE	Depth feet	COMMENTS
R2-U	5/11/1981	-43.33	
R2-U	4/11/1981	-53.03	
R2-U	3/16/1981	-47.49	
R2-U	2/9/1981	-29.43	
R2-U	1/8/1981	-25.08	
R2-U	12/9/1980	-26.2	
R2-U	11/7/1980	-26.43	
R2-U	10/13/1980	-28.05	
R2-U	9/17/1980	-21.39	
R2-U	8/10/1980	36.93	
R2-U	7/15/1980	-11.14	
R2-U	6/11/1980	-11.14	
R2-U	5/2/1980	-15.76	
R2-U	4/18/1980	-15.76	
R2-U	3/14/1980	-15.76	
R2-U	12/7/1979	-175.33	

John Gefferth
March 12, 2012

ATTACHMENT B

Laboratory Analytical Reports

ANALYTICAL LABORATORIES

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web: www.awal-labs.com

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

Rich White
EarthFax Engineering
7324 So. Union Park Ave., # 100
Midvale, UT 84047
TEL: (801) 561-1555

RE: Emery / Consol

Dear Rich White: Lab Set ID: 1201352

American West Analytical Laboratories received 5 sample(s) on 1/25/2012 for the analyses presented in the following report.

All analyses were performed in accordance to The NELAC Institute protocols unless noted otherwise. American West Analytical Laboratories is accredited by The NELAC Institute in Utah and Texas; and is state accredited in Colorado, Idaho, and Missouri. Accreditation documents are available upon request. If you have any questions or concerns regarding this report please feel free to call.

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Thank You,

Approved by: Kyle F. Gross — Digitally signed by Kyle F. Gross DN: cn=Kyle F. Gross, o=AWAL, ou=AWAL, email=kyle@awal-labs.com, c=US Date: 2012.01.27 10:19:17 -07'00'

Laboratory Director or designee

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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

ORGANIC ANALYTICAL REPORT

Client: EarthFax Engineering **Contact:** Rich White
Project: Emery / Consol
Lab Sample ID: 1201352-001A
Client Sample ID: H-V
Collection Date: 1/24/2012 1130h
Received Date: 1/25/2012 933h **Method:** SW8260C

Analytical Results VOAs MBTEXN List by GC/MS Method 8260C/5030C

Analyzed: 1/26/2012 051h
Units: mg/L **Dilution Factor:** 1

Compound	CAS Number	Reporting Limit	Analytical Result	Qual
Benzene	71-43-2	0.00100	< 0.00100	
Ethylbenzene	100-41-4	0.00200	< 0.00200	
Naphthalene	91-20-3	0.00200	< 0.00200	
Toluene	108-88-3	0.00200	< 0.00200	
Xylenes, Total	1330-20-7	0.00200	< 0.00200	

Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr: Toluene-d8	2037-26-5	0.0504	0.05000	101	77-129	
Surr: Dibromofluoromethane	1868-53-7	0.0505	0.05000	101	80-124	
Surr: 4-Bromofluorobenzene	460-00-4	0.0503	0.05000	101	80-128	
Surr: 1,2-Dichloroethane-d4	17060-07-0	0.0574	0.05000	115	74-151	

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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

ORGANIC ANALYTICAL REPORT

Client: EarthFax Engineering **Contact:** Rich White
Project: Emery / Consol
Lab Sample ID: 1201352-002A
Client Sample ID: H-L
Collection Date: 1/24/2012 1145h
Received Date: 1/25/2012 933h **Method:** SW8260C

Analytical Results VOAs MBTEXN List by GC/MS Method 8260C/5030C

Analyzed: 1/26/2012 114h
Units: mg/L **Dilution Factor:** 1

Compound	CAS Number	Reporting Limit	Analytical Result	Qual
Benzene	71-43-2	0.00100	**0.00119**	
Ethylbenzene	100-41-4	0.00200	< 0.00200	
Naphthalene	91-20-3	0.00200	< 0.00200	
Toluene	108-88-3	0.00200	< 0.00200	
Xylenes, Total	1330-20-7	0.00200	< 0.00200	

Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr: Toluene-d8	2037-26-5	0.0510	0.05000	102	77-129	
Surr: Dibromofluoromethane	1868-53-7	0.0521	0.05000	104	80-124	
Surr: 4-Bromofluorobenzene	460-00-4	0.0520	0.05000	104	80-128	
Surr: 1,2-Dichloroethane-d4	17060-07-0	0.0609	0.05000	122	74-151	

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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

ORGANIC ANALYTICAL REPORT

Client: EarthFax Engineering **Contact:** Rich White
Project: Emery / Consol
Lab Sample ID: 1201352-003A
Client Sample ID: I-L
Collection Date: 1/24/2012 1210h
Received Date: 1/25/2012 933h **Method:** SW8260C

Analytical Results VOAs MBTEXN List by GC/MS Method 8260C/5030C

Analyzed: 1/26/2012 136h
Units: mg/L **Dilution Factor:** 1

Compound	CAS Number	Reporting Limit	Analytical Result	Qual
Benzene	71-43-2	0.00100	< 0.00100	
Ethylbenzene	100-41-4	0.00200	< 0.00200	
Naphthalene	91-20-3	0.00200	< 0.00200	
Toluene	108-88-3	0.00200	< 0.00200	
Xylenes, Total	1330-20-7	0.00200	< 0.00200	

Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr: Toluene-d8	2037-26-5	0.0492	0.05000	98.4	77-129	
Surr: Dibromofluoromethane	1868-53-7	0.0499	0.05000	99.8	80-124	
Surr: 4-Bromofluorobenzene	460-00-4	0.0492	0.05000	98.5	80-128	
Surr: 1,2-Dichloroethane-d4	17060-07-0	0.0575	0.05000	115	74-151	

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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

ORGANIC ANALYTICAL REPORT

Client: EarthFax Engineering **Contact:** Rich White
Project: Emery / Consol
Lab Sample ID: 1201352-004A
Client Sample ID: I-BG
Collection Date: 1/24/2012 1215h
Received Date: 1/25/2012 933h **Method:** SW8260C

Analytical Results VOAs MBTEXN List by GC/MS Method 8260C/5030C

Analyzed: 1/26/2012 159h
Units: mg/L **Dilution Factor:** 1

Compound	CAS Number	Reporting Limit	Analytical Result	Qual
Benzene	71-43-2	0.00100	**0.00204**	
Ethylbenzene	100-41-4	0.00200	< 0.00200	
Naphthalene	91-20-3	0.00200	< 0.00200	
Toluene	108-88-3	0.00200	**0.00465**	
Xylenes, Total	1330-20-7	0.00200	< 0.00200	

Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr: Toluene-d8	2037-26-5	0.0501	0.05000	100	77-129	
Surr: Dibromofluoromethane	1868-53-7	0.0503	0.05000	101	80-124	
Surr: 4-Bromofluorobenzene	460-00-4	0.0521	0.05000	104	80-128	
Surr: 1,2-Dichloroethane-d4	17060-07-0	0.0581	0.05000	116	74-151	

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Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer

ORGANIC ANALYTICAL REPORT

Client: EarthFax Engineering **Contact:** Rich White
Project: Emery / Consol
Lab Sample ID: 1201352-005A
Client Sample ID: AA-V
Collection Date: 1/24/2012 1400h
Received Date: 1/25/2012 933h **Method:** SW8260C

Analytical Results VOAs MBTEXN List by GC/MS Method 8260C/5030C

Analyzed: 1/26/2012 221h
Units: mg/L **Dilution Factor:** 1

Compound	CAS Number	Reporting Limit	Analytical Result	Qual
Benzene	71-43-2	0.00100	< 0.00100	
Ethylbenzene	100-41-4	0.00200	< 0.00200	
Naphthalene	91-20-3	0.00200	< 0.00200	
Toluene	108-88-3	0.00200	< 0.00200	
Xylenes, Total	1330-20-7	0.00200	< 0.00200	

Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr: Toluene-d8	2037-26-5	0.0491	0.05000	98.3	77-129	
Surr: Dibromofluoromethane	1868-53-7	0.0485	0.05000	97.0	80-124	
Surr: 4-Bromofluorobenzene	460-00-4	0.0491	0.05000	98.2	80-128	
Surr: 1,2-Dichloroethane-d4	17060-07-0	0.0549	0.05000	110	74-151	

American West Analytical Laboratories

D

WORK ORDER Summary

Work Order: 1201352

Page 1 of 1 1/25/2012

Client: EarthFax Engineering

Client ID: EAR100 **Contact:** Rich White

Project: Emery / Consol **QC Level:** LEVEL I **WO Type:** Standard

Comments: PA Rush;

Sample ID	Client Sample ID	Collected Date	Received Date	Date Due	Matrix	Test Code	Sel	Storage	
1201352-001A	H-V	1/24/2012 1130h	1/25/2012 0933h	2/3/2012	Aqueous	8260-W-PPM	☑	Purge	2
1201352-002A	H-L	1/24/2012 1145h				8260-W-PPM	☑	Purge	
1201352-003A	I-L	1/24/2012 1210h				8260-W-PPM	☑	Purge	
1201352-004A	I-BG	1/24/2012 1215h				8260-W-PPM	☑	Purge	
1201352-005A	AA-V	1/24/2012 1400h				8260-W-PPM	☑	Purge	

Client: Earth Fax

Address: 7324 South Union Park Ave

Midvale (City) UT (State) 84047 (Zip)

Phone: 801-561-1555 Fax:

Contact: Richard White

E-mail: rwhite@earthfax.com

Project Name: Emery/Consol

Project Number/P.O.#:

Sampler Name: Tim Jimenez

AMERICAN WEST ANALYTICAL LABORATORIES
463 West 3600 South
Salt Lake City, Utah 84115

CHAIN OF CUSTODY

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Email:awal@awal-labs.com

Lab Sample Set # 1201352

Page _____ of _____

Turn Around Time (Circle One)

1 day 2 day 3 day 4 day 5 day (Standard)

Sample ID	Date/Time Collected	Matrix	Number of Containers (Total)	TESTS REQUIRED: BTEX
H-U	1/24/12 11:30	W	2	1
H-L	11:45			
I-L	12:10			
I-BG	12:15			
AA-U	14:00			

QC LEVEL: 1 2 2+ 3 3+ 4

COMMENTS

LABORATORY USE ONLY

SAMPLES WERE:
1 Shipped or hand delivered
Notes:
2 Ambient or Chilled
Notes: on ice
3 Temperature 5.0
4 Received Broken/Leaking (Improperly Sealed) Y (N)
Notes:
5 Properly Preserved Y N
Checked at Bench Y N
Notes:
6 Received Within Holding Times Y N
Notes:

COC Tape Was:
1 Present on Outer Package Y N NA
2 Unbroken on Outer Package Y N NA
3 Present on Sample Y N NA
4 Unbroken on Sample Y N NA

Discrepancies Between Sample Labels and COC Record? Y (N)
Notes:

Relinquished By: Signature	Date	Received By: Signature	Date
PRINT NAME: T. Jimenez	Time: 09:33	PRINT NAME: Elma Hayward	Time: 1133
Relinquished By: Signature	Date	Received By: Signature	Date
PRINT NAME	Time	PRINT NAME	Time
Relinquished By: Signature	Date	Received By: Signature	Date
PRINT NAME	Time	PRINT NAME	Time
Relinquished By: Signature	Date	Received By: Signature	Date
PRINT NAME	Time	PRINT NAME	Time

Special Instructions:

SAVANT, INC.
4800 JAMES SAVAGE ROAD
MIDLAND, MICHIGAN 48642
TELEPHONE (989) 496-2301
FACSIMILE (989) 496-3438
http:\\www.savantgroup.com
email: savant@savantgroup.com

2012 February 22

Mr. Richard White
EARTHFAX ENGINEERING
7324 S. Union Park Avenue
Suite 100
Midvale, UT 84047

Ref: EarthFax Engineering Sample ID: H-M, H-L, H-V & AA-M
Savant Sample ID: S120131D through G
Savant Lab Code: EEI01-2012-001

Dear Mr. White:

Enclosed are the test results for your sample(s) listed above which were emailed to you on February 15. Please call if you have any questions regarding the data.

We appreciate your business with Savant Laboratory.

Best regards,

Rebecca Cox

Rebecca Cox
Vice President,
Operations & Finance

sd

Enclosure

SAVANT

2012 February 15

EarthFax Engineering

Kinematic Viscosity
ASTM D445

Customer ID:	Savant ID:	@ 40°C (cSt)	@ 100°C (cSt)
H-M	S120131D	31.29	5.278
H-L	S120131E	0.6666	*
H-V	S120131F	0.6718	*
AA-M	S120131G	31.89	5.318

* Unable to obtain viscosity at temperature

Theodore W. Selby

Theodore W. Selby
Director, R & D

SAVANT

2012 February 15

EarthFax Engineering

Simulated Distillation by Gas Chromatography
ASTM D6417

Customer ID:	Savant ID:	% Volatized @ 371°C
H-M	S120131D	11.0
AA-M	S120131G	11.0

Theodore W. Selby
Director, R & D

maf

SAVANT ASTM D 2887 Extended

Sample name	: S120131D		
Acquired on	: 2/8/2012 11:01:51 PM	Vial	: 8
Processed on	: 2/9/2012 9:39:21 AM	Injection	: 1
Sample type	: Sample	Sample (g)	: 0.1059
Method name	: 2887EXTA	Solvent (g)	: 1.1910
Operator	: CPOR	ISTD (g)	: 0.0000
Sequence name	: C:\Chem32\1\DATA\d120208\S120208 2012-02-08 16-29-28\S120208.S		
Data File	: D120208\S120208 2012-02-08 16-29-28\008F1001.D\		

General Variables

Used Blank	d120208\s120208 2012-02-08 16-29-28\001f0901.d
Used BP calibrant	d120124\s120124 2012-01-25 09-22-37\002f0201.d
Used Start elution (min)	0.213
Used End elution (min)	32.747
Total area	1377614

BP Distribution table - Percent

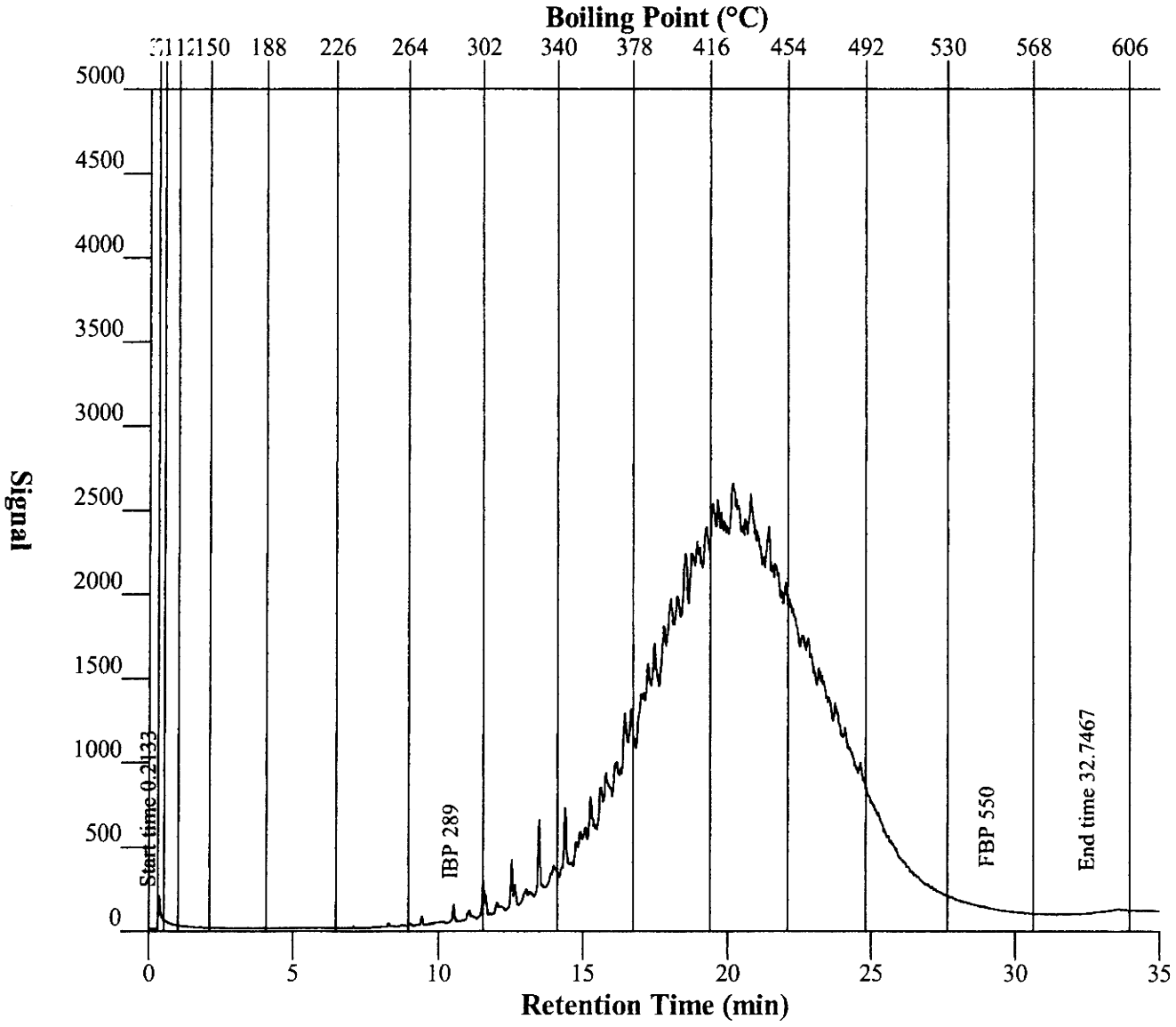
Recovered mass%	BP °C	Recovered mass%	BP °C	Recovered mass%	BP °C	Recovered mass%	BP °C
IBP	288.6	26.0	399.0	52.0	429.4	78.0	461.6
1.0	304.0	27.0	400.6	53.0	430.6	79.0	463.0
2.0	322.4	28.0	401.8	54.0	431.8	80.0	464.6
3.0	332.8	29.0	403.2	55.0	432.8	81.0	466.2
4.0	342.0	30.0	404.4	56.0	433.8	82.0	468.0
5.0	348.0	31.0	405.8	57.0	435.0	83.0	469.8
6.0	353.4	32.0	407.0	58.0	436.0	84.0	471.6
7.0	357.6	33.0	408.2	59.0	437.0	85.0	473.4
8.0	361.8	34.0	409.6	60.0	438.2	86.0	475.4
9.0	365.2	35.0	410.6	61.0	439.2	87.0	477.6
10.0	368.2	36.0	411.8	62.0	440.6	88.0	479.6
11.0	371.2	37.0	413.2	63.0	441.6	89.0	482.0
12.0	373.8	38.0	414.2	64.0	442.8	90.0	484.4
13.0	376.2	39.0	415.4	65.0	444.2	91.0	487.0
14.0	378.4	40.0	416.6	66.0	445.2	92.0	489.8
15.0	380.6	41.0	417.6	67.0	446.4	93.0	493.0
16.0	382.8	42.0	418.6	68.0	447.6	94.0	496.4
17.0	384.6	43.0	419.8	69.0	448.8	95.0	500.6
18.0	386.4	44.0	421.0	70.0	450.0	96.0	505.6
19.0	388.2	45.0	421.8	71.0	451.4	97.0	512.2
20.0	389.8	46.0	423.0	72.0	453.0	98.0	521.4
21.0	391.6	47.0	424.2	73.0	454.2	99.0	536.8
22.0	393.4	48.0	425.4	74.0	455.6	FBP	550.2
23.0	394.8	49.0	426.4	75.0	456.8		
24.0	396.2	50.0	427.4	76.0	458.4		
25.0	397.8	51.0	428.4	77.0	459.8		

SAVANT ASTM D 2887 Extended 2

Sample name	: S120131D		
Acquired on	: 2/8/2012 11:01:51 PM	Vial	: 8
Processed on	: 2/9/2012 9:39:21 AM	Injection	: 1
Data File	: D120208\S120208 2012-02-08 16-29-28\008F1001.D\		

BP Distribution table - cut points

BP °C	Recovered mass%	Fraction mass%
371.0	11.0	11.0



SAVANT ASTM D 2887 Extended 1

Sample name	: S120131G		
Acquired on	: 2/8/2012 11:50:42 PM	Vial	: 9
Processed on	: 2/9/2012 9:39:23 AM	Injection	: 1
Sample type	: Sample	Sample (g)	: 0.1025
Method name	: 2887EXTA	Solvent (g)	: 1.2379
Operator	: CPOR	ISTD (g)	: 0.0000
Sequence name	: C:\Chem32\1\DATA\d120208\S120208 2012-02-08 16-29-28\S120208.S		
Data File	: D120208\S120208 2012-02-08 16-29-28\009F1101.D\		

General Variables

Used Blank	d120208\s120208 2012-02-08 16-29-28\001f0901.d
Used BP calibrant	d120124\s120124 2012-01-25 09-22-37\002f0201.d
Used Start elution (min)	0.200
Used End elution (min)	32.573
Total area	1492928

BP Distribution table - Percent

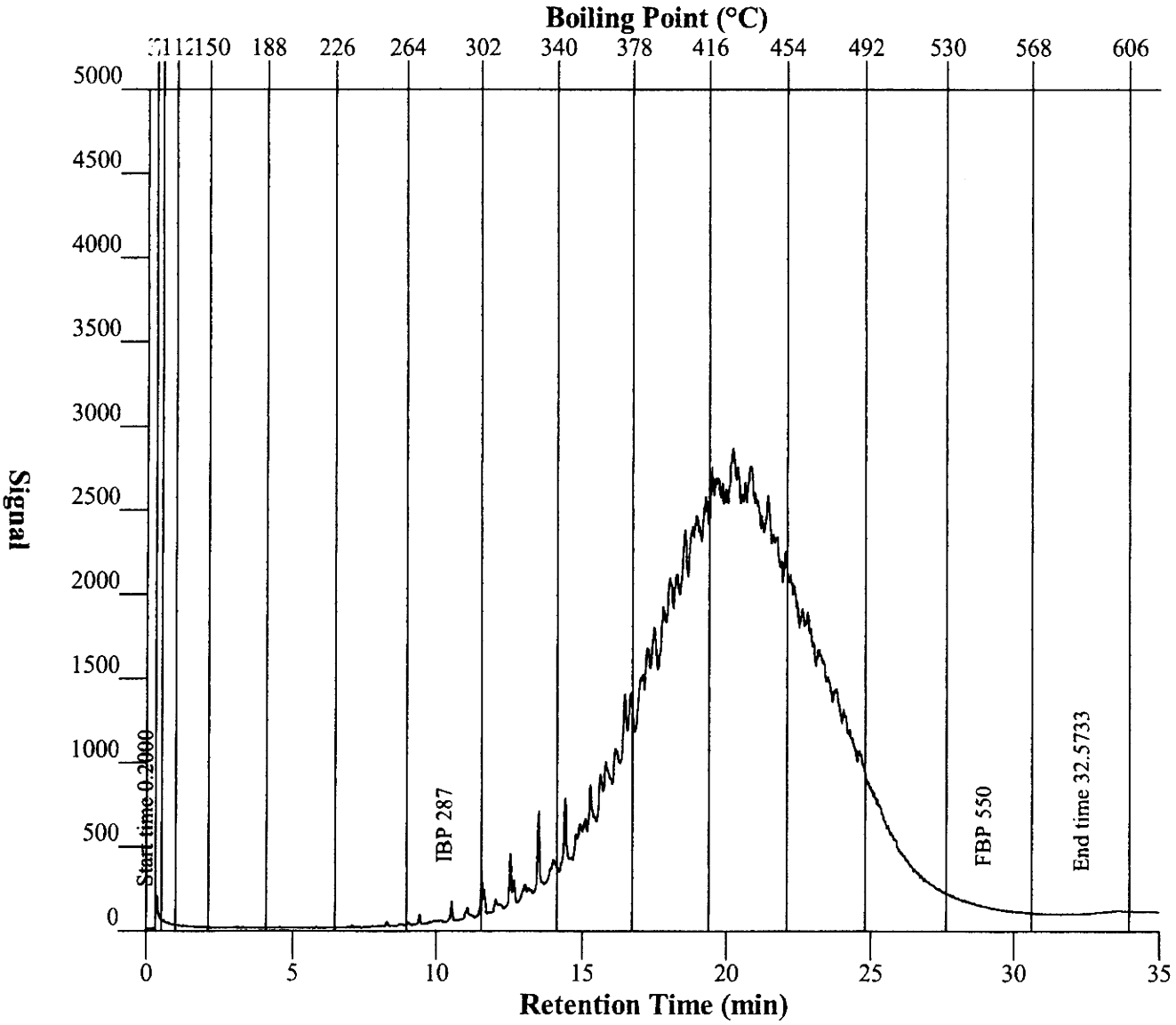
Recovered mass%	BP °C	Recovered mass%	BP °C	Recovered mass%	BP °C	Recovered mass%	BP °C
IBP	286.8	26.0	399.2	52.0	429.8	78.0	461.6
1.0	303.2	27.0	400.6	53.0	431.0	79.0	463.4
2.0	321.2	28.0	402.0	54.0	432.2	80.0	464.8
3.0	332.0	29.0	403.4	55.0	433.0	81.0	466.6
4.0	341.4	30.0	404.8	56.0	434.2	82.0	468.2
5.0	347.6	31.0	406.0	57.0	435.4	83.0	470.0
6.0	353.0	32.0	407.2	58.0	436.4	84.0	471.8
7.0	357.4	33.0	408.6	59.0	437.4	85.0	473.8
8.0	361.6	34.0	409.6	60.0	438.4	86.0	475.6
9.0	365.0	35.0	410.8	61.0	439.6	87.0	478.0
10.0	368.0	36.0	412.2	62.0	440.8	88.0	480.0
11.0	371.0	37.0	413.4	63.0	442.0	89.0	482.2
12.0	373.6	38.0	414.4	64.0	443.2	90.0	484.6
13.0	376.0	39.0	415.6	65.0	444.2	91.0	487.4
14.0	378.4	40.0	416.8	66.0	445.4	92.0	490.2
15.0	380.6	41.0	417.8	67.0	446.8	93.0	493.4
16.0	382.8	42.0	419.0	68.0	447.8	94.0	496.8
17.0	384.6	43.0	420.0	69.0	449.2	95.0	500.8
18.0	386.4	44.0	421.2	70.0	450.4	96.0	505.8
19.0	388.2	45.0	422.2	71.0	451.8	97.0	512.2
20.0	389.8	46.0	423.4	72.0	453.0	98.0	521.4
21.0	391.8	47.0	424.6	73.0	454.4	99.0	536.2
22.0	393.4	48.0	425.6	74.0	455.8	FBP	549.8
23.0	394.8	49.0	426.6	75.0	457.2		
24.0	396.4	50.0	427.8	76.0	458.8		
25.0	397.8	51.0	428.8	77.0	460.2		

SAVANT ASTM D 2887 Extended 2

Sample name	: S120131G		
Acquired on	: 2/8/2012 11:50:42 PM	Vial	: 9
Processed on	: 2/9/2012 9:39:23 AM	Injection	: 1
Data File	: D120208\S120208 2012-02-08 16-29-28\009F1101.D\		

BP Distribution table - cut points

BP °C	Recovered mass%	Fraction mass%
371.0	11.0	11.0



SAVANT

2012 February 15

EarthFax Engineering

Elemental Analysis by ICP
ASTM D4951 (ppm)

Customer ID:	H-M	AA-M
Savant ID:	S120131D	S120131G
Silver	*	*
Aluminum	6	*
Boron	*	*
Barium	*	*
Calcium	8	18
Chromium	*	*
Copper	*	*
Iron	49	*
Potassium	*	*
Magnesium	5	*
Manganese	*	*
Molybdenum	*	*
Sodium	*	*
Nickel	*	*
Phosphorus	8	19
Lead	*	6
Antimony	*	*
Silicon	12	*
Tin	*	*
Titanium	*	*
Vanadium	*	*
Zinc	191	98

* Denotes <5

Theodore W. Selby
Director, R & D

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